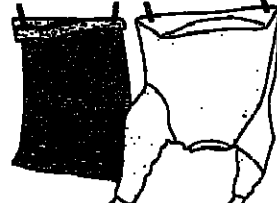


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World Business Newspaper

WEDNESDAY JUNE 7 1995

08523A

Problem loans at Japanese banks run to Y40,000bn

The full scale of Japan's bad debt problem was far worse than previously thought, Yoshihisa Nishimura, director-general of the Finance Ministry's banking bureau, said. Total problem loans at the country's banks amounted to about Y40,000bn (\$400bn), a sum equivalent to almost 10 per cent of the country's gross domestic product. Page 14

Yeltsin seeks energy investments Russian president Boris Yeltsin signalled an increasing Russian openness to foreign investment in its asset-rich but crisis-prone energy sector. Page 14; A world concern. Page 2

Schwarz Pharma moves into US Fast-growing German pharmaceutical company Schwarz Pharma announced two US acquisitions worth \$294m as part of its strategy of developing business outside Europe. Page 15

Tokyo cult leader charged with murder Shoko Asahara (left), leader of Aum Shinri Kyo, the Japanese doomsday cult, and six of his followers were indicted on charges of murder and attempted murder for the Tokyo subway nerve gas attack in March. Prosecutors accused him of masterminding the attack; the six others were accused of making the sarin nerve gas and releasing it in the attack, which killed 12 people and injured 5,500. Page 4

El Corte Ingles tipped to buy rival Spanish retail group El Corte Ingles is today expected to acquire former rival Galerias Preciados, which last year applied for protection from creditors. Page 15

Nafta ministers to discuss Chile Trade ministers from the US, Canada and Mexico meet today to discuss Chile's bid to join the North American Free Trade Agreement. Page 14

EU and Japan reach deal on cars The EU and Japan reached agreement on measures to improve European access to the Japanese markets for cars and car parts. Page 7

VW plans joint venture in Israel Volkswagen of Germany and Israel's Dead Sea Works plan a joint venture worth up to \$300m to produce and sell magnesium. Page 7

Beijing opens way for foreign banks China cleared the way for five foreign banks to establish branches in Beijing. Page 4

Incentives sought to scrap old cars The UK motor trade called on the government to follow France and Spain in offering financial help to motorists to encourage the scrapping of old vehicles. Page 8

Record profits from Nuclear Electric State-owned UK power utility Nuclear Electric strengthened the prospects for a successful privatisation by announcing operating profits up 53 per cent to a record £1.2bn (\$1.9bn). Page 15

S Africa unions show strength More than 50,000 trade unionists seeking to influence new labour relations legislation marched through Johannesburg in the biggest display of political strength since last year's general elections. Page 5

London share prices move further ahead Share prices edged further forward in London, ignoring nervousness ahead of today's meeting between Bank of England governor Eddie George and chancellor of the exchequer Kenneth Clarke. The FT-SE 100 index climbed 3.4 points to 3,380.0, its fifth straight gain and a 15-month high. Wall Street gave European markets a fresh boost when the Dow Jones Industrial Average responded to a fresh burst of buying interest. In early afternoon trading the Dow was 11.07 points up at 4,437.62. London stocks. Page 34; World stocks. Page 38

Sales to play again Former world number one woman player Monica Seles will return to tennis for an exhibition match against Martina Navratilova on July 29. The venue has not been announced. Seles has not played since being stabbed during a tournament in Germany two years ago.

STOCK MARKET INDICES

Index	Value	Change
New York: Dow Jones	4,437.62	(+11.07)
NASDAQ Composite	2,081.08	(+1.08)
Europe and Far East	1,955.94	(+3.30)
FTSE 100	3,380.0	(+3.4)
Nikkei	15,989.5	(+238.3)

US LUNCHTIME RATES

Rate	Value	Change
3-month Treasury bill	5.67%	
Long term	6.42%	

OTHER RATES

Rate	Value	Change
UK 3-month interbank	5.5%	
UK 10 yr gilt	10.5%	
France 10 yr OAT	10.1%	
Germany 10 yr Bund	10.2%	
Japan 10 yr JGB	11.5%	

NORTH SEA OIL (August)

Contract	Price	Change
15-day (July)	\$17.85	(+0.05)

ASIAN STOCKS

Market	Value	Change
Asia: Nikkei	15,989.5	(+238.3)
Hang Seng	10,100	(+100)
Hong Kong	10,100	(+100)
Shanghai	10,100	(+100)
Beijing	10,100	(+100)
Seoul	10,100	(+100)
Taipei	10,100	(+100)
Manila	10,100	(+100)
Bangkok	10,100	(+100)
Colombo	10,100	(+100)
Calcutta	10,100	(+100)
Delhi	10,100	(+100)
Mumbai	10,100	(+100)
Jaipur	10,100	(+100)
Bhopal	10,100	(+100)
Chennai	10,100	(+100)
Hyderabad	10,100	(+100)
Patna	10,100	(+100)
Ranchi	10,100	(+100)
Srinagar	10,100	(+100)
Thiruvananthapuram	10,100	(+100)
Udaipur	10,100	(+100)
Vadodra	10,100	(+100)
Vijayawada	10,100	(+100)
Visakhapatnam	10,100	(+100)
Warangal	10,100	(+100)
Yamuna Nagar	10,100	(+100)

Tests reveal fault in GE engines for Boeing 777

By Michael Skapinker in London and Tony Jackson in New York

The General Electric engines being built for British Airways Boeing 777 aircraft have run into difficulties which were revealed when bird carcasses were fired into them during testing. GE said yesterday that firing the bird carcasses, which is a standard feature of the testing process, had resulted in an unexpected degree of imbalance in the engine's fan. Modifications were required to ensure an even flow of air to the fan.

The first Boeing 777 to enter service is due to make its maiden flight from London to Washington DC today. That flight, operated by United Airlines, will not be affected by the GE announcement, as the United Boeing 777 has engines from GE's rival, Pratt & Whitney of the US. BA said yesterday that GE and Boeing still hope to deliver the first of the airline's 777s in September, as planned. BA has ordered 15 Boeing 777s and has options on another 15. It is the second biggest customer for the aircraft after United, which has

firm orders for 34 and options on another 34. BA surprised the industry in 1991 when it ordered the GE engines for the 777 in preference to those of Rolls-Royce, the UK manufacturer which had been its favoured supplier. BA plans to use the aircraft, which carry up to 400 passengers, on flights from the UK to the Middle East and to the eastern part of North America. GE said yesterday the level of testing for the engines had been unprecedented. The company said: "It is better to bring out

these problems now than when the engine is in service. We offer BA the safest, most trouble-free engine there is." The problems are a further embarrassment to GE after similar difficulties earlier this year in the closely related technology of gas turbines for power stations. Critical parts in its F-series turbines had to be recalled from customers in the UK and Korea. The Boeing 777 is the world's largest twin-jet passenger aircraft. The engines for the aircraft are so large that the fuselage of a Boeing 737 could

pass through their outer casing. Rolls-Royce, which has sold engines for Boeing 777s to Cathay Pacific, Thai Airways International, Emirates and Transbrasil, said yesterday that testing was proceeding successfully. The company said firing birds into its engines had not revealed any difficulties. "Our strategy is to concentrate on our own programme and let our competitors concentrate on theirs," Rolls-Royce said. The first Boeing 777 to be powered by the Rolls-Royce engines made a successful flight in Seattle late last month. Thai Airways

is expected to be the first airline to begin commercial flights with a Rolls-Royce powered Boeing 777 in January next year. The 777 is Boeing's first new aircraft in 13 years, designed to compete with Airbus Industrie's A330 and A340 and the McDonnell Douglas MD-11. Although Boeing is the world's largest aircraft manufacturer, with over 60 per cent of sales, Airbus, the European consortium, last year won more orders. Saudia Arabia Airlines is believed to be close to placing an order for 23 Boeing 777s.

Move comes as Britain outlines conditions for keeping troops in Bosnia

Serbs set to free UN hostages

By George Parker and Bruce Clark in London, and Laura Silber in Belgrade

Bosnian Serbs were poised last night to release another 58 United Nations peacekeeper hostages after pressure from Western governments and intervention by the Serbian government.

The expected release followed negotiations between the Bosnian Serbs and Serbia's president Slobodan Milosevic who put pressure on his former protégés to free all the UN peacekeepers in their custody.

The Bosnian Serb move came after Britain set tough conditions for keeping its troops in Bosnia, insisting they would not remain unless they had "minimum" consent from the Bosnian government and the Bosnian Serbs.

A bus with 58 UN peacekeepers detained by the Bosnian Serbs arrived in the town of Zvornik on the Bosnian-Serbian border and the detainees were expected to be handed over to Serbia last night.

The hostages were among nearly 400 captured by the Bosnian Serbs in retaliation for Nato air strikes against an ammunition dump. If the 58 troops, believed to be mostly Ukrainian and French, are released, about 200 will remain in custody.

The US, which has been moving reinforcements to Italy for possible use in Bosnia, said yesterday that it had stopped receiving beacon signals which might have come from a US fighter pilot whose F-16 aircraft was downed over Bosnia last week.

A confirmation that the pilot was dead would increase the chances of the US taking tough action against the Bosnian Serbs. The US administration is under pressure from Congress to punish the Serbs, despite West European and Russian concerns to avoid escalating the conflict.



Andrej Kozyrev (left) said Douglas Hurd (right) reassured him London did not want the UN to become a combatant in the conflict. Picture: EPA

London's new concern to avoid getting drawn into all-out war was also reflected in a meeting between senior UK ministers and Mr Andrej Kozyrev, the Russian foreign minister. Mr Kozyrev said after talks with Mr Douglas Hurd, UK foreign secretary, and Mr Malcolm Rifkind, UK defence secretary, that he had been assured Britain did not want the UN to become a combatant in the conflict. The Russian minister will have further talks with Mr John Major, the UK prime minister, today on Bosnia and Russian

relations with the West. Mr Kozyrev wants reassurances that the despatch of 10,000 extra western troops to Bosnia was not a signal of a plan to fight the Serbs, Russia's traditional ally. Mr Rifkind denied strongly in the British parliament that any decision to withdraw from Bosnia had been taken. He said the purpose of sending reinforcements was to ensure the safety of the existing UN peacekeeping force. However an increased concern to avoid getting drawn into open war was spelled out by British officials after a discussion on

Bosnian policy among senior UK ministers earlier this week. "There has to be a minimum level of consent by the parties," said one official, setting out Britain's view of the preconditions for a continued UN role in Bosnia. Bosnia's foreign minister, meanwhile, cast doubt on the

future of the UN mission, saying its end could be in sight. "The UN mission is becoming more tenuous, both in terms of quality and potential duration," said the minister, Mr Muhamed Sacirbey. "We have to keep in mind that there is a real possibility the UN mission in Bosnia could end."

Labatt agrees C\$28.50 per share offer from Interbrew

By Bernard Simon in Toronto and Frederick Oram in London

Interbrew, the privately owned Belgian brewer, has launched an unexpected but aggressive foray into North America with a C\$2.7bn (\$1.98bn) bid for John Labatt, the Toronto-based beer and entertainment group. Labatt has agreed the offer.

The deal, if successful, would make Interbrew, best known for Stella Artois lager, one of the few truly international brewers along with Heineken of the Netherlands. It would rank sixth in volume terms in the world, according to Canadian, the drinks consultant.

Besides its core Canadian business, Labatt has a well-established US distribution network, a 22 per cent stake in Famosa Cerveza, Mexico's second-biggest brewer, and interests in Italy and in the UK, where it has a chain of more than 500 pubs.


Interbrew has strong positions in Belgium, France and the UK, where Stella is brewed under licence by Whitbread, and it has been investing in eastern Europe and China. It said there was wide

scope for it to sell Labatt beers, including Rolling Rock, in Europe and its own beers in North America. Interbrew emerged yesterday as the "white knight" which Labatt sought to fend off a hostile bid from Onex, the Canadian leveraged buyout firm. Labatt provided that it had conducted a "well-attended" auction, and has now agreed not to negotiate with any other potential bidder. It will urge shareholders to accept the Interbrew offer, at C\$28.50 a share, is well above Onex's C\$24 offer. Mr George Taylor, chief executive, said that the Interbrew deal would benefit all Labatt's constituencies - shareholders, employees, customers and partners. Mr Michael Palmer, analyst at Research Equity in Toronto, said that the Interbrew offer is "about as good as it gets". Mr Palmer noted that Labatt has a substantially greater value to Interbrew than Onex, which has no other brewing interests that might benefit Onex said yesterday it would not increase its offer. With Labatt tactically up for sale for several years, a number of


other brewers had looked at buying it. Given Interbrew's apparently fully priced offer, analysts thought a competing bid from another brewer was unlikely. An Interbrew spokesman said the bid would consist of C\$1.1bn in cash largely from its own resources plus C\$1.6bn in debt provided mainly by a group of North American banks. However, Interbrew is expected to dispose of Labatt's non-brewing assets, which analysts value at C\$800m-C\$1bn. They include an international concert promoter, Canadian cable-TV stations, and 90 per cent of the Toronto Blue Jays baseball team. The Interbrew offer requires the approval of holders of two-thirds of Labatt's shares. If a better bid materialises, Labatt has agreed, among other things, to give the Belgian company an option to buy Moretti, Labatt's Italian subsidiary, for C\$165m. Interbrew said it had begun negotiations with Labatt two months ago and was already engaged in due diligence when Onex bid.

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May 1995

NEWS: EUROPE

East Europeans enjoy EU's open day

By Caroline Southey in Luxembourg

It was an inauspicious start for the nine eastern and central European countries waiting in the queue for admission to Europe's exclusive club. The crunch came after six hours devoted to discussing their problems, including an extended lunch. No, the French presidency announced, the scheduled press conference would not take place. The EU's meeting of internal market ministers had run out of time.

Ministers from Poland, Hungary, the Czech Republic, Slovakia, Bulgaria, Hungary, Estonia, Latvia and Lithuania were in Luxembourg to meet their EU counterparts to discuss their prospective membership of the

EU. "We were ready for a press conference. But they said there was no more time," said Mr Laszlo Pal, Hungary's minister for industry and commerce, with a shrug.

Tucked away in a box-sized office with one phone and too few chairs, the Hungarian minister put a brave face on the day's proceedings. "My feeling is that overall it has been successful."

"It was much better than on previous occasions," Mr Pal said.

Mr Vladimir Dlouhy, minister of industry and trade for the Czech Republic, was similarly upbeat. "There have been times when it has felt as though this is a one-way street."

But I think the European Union

was hearing us today when we said 'you have to adjust as well'. We said again that absorbing the new members with the Common Agricultural Policy in fact would have disastrous consequences for us," he said.

The Austrians, who joined the EU in January, and Germans were given the task of providing useful tips on what to do.

Mr Johannes Ludwig, the German secretary of state for the economic affairs, presented the problems faced by Bonn after the absorption of the eastern German Länder into a united Germany.

His was a short but sobering list which highlighted the administrative holes which needed to be plugged. These included the transfer of thou-

sands of civil servants as well as hundreds of training programmes to create an administrative structure, the creation of laws to govern real estate and property ownership and the deployment of thousands of customs officials to apply EU regulations on the eastern front.

"I think the German experience was a unique one. Nowhere else would it be possible to replace one set of laws with another in the space of one day."

"We can listen to this but we can't practice it," Mr Pal said.

But by all accounts the ice was broken between ministers of the old and new over lunch.

"During the lunch I felt for the first time that I was facing people

seriously searching for a two-way dialogue. It may be the effect of Austria and Sweden joining. I don't know," said Mr Dlouhy.

"We learnt what the sensitivities were, what concessions should be made to them and that we need to accommodate each country as it makes progress at its own different pace," said Mr Ian Taylor, Britain's minister for trade.

All appeared to have ended the day a little wiser. "I think they fully understand the eastern European situation. On that basis there appears to be a clear political will to get to accession as soon as possible," Mr Pal said.

How and exactly when were left for another day.

Russia's oil: a world concern

John Thornhill on a sector with transforming potential beyond the country's borders

Mr Leonid Fedun, the vice-president of Lukoil, Russia's largest privatised oil company, sits back in his black leather chair in his high-rise office and chuckles. "One journalist wrote that we planned to buy Exxon within 15 years," he says. "We were very surprised by this statement. It will be 10."

As befits any statement from a former psychological warfare officer from the Dzerzhinsky military academy, it is difficult to distinguish threat from bluff. But there is no ambiguity about the ambition of Russia's new generation of energy company executives.

"The rule of life is that new companies are more hungry than those which have been on the market a long time. We are going to be very active and win our place in the sun," Mr Fedun says.

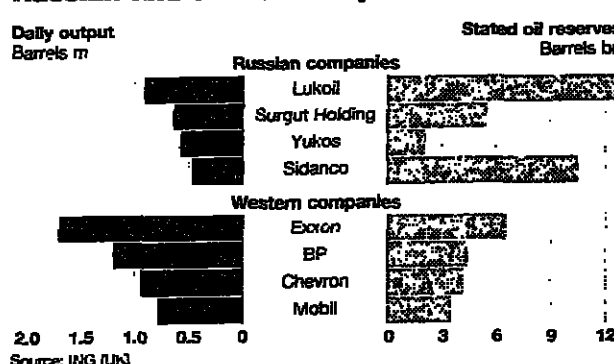
Lukoil is perhaps the most aggressive and progressive company to have emerged from the vast corporate scramble that constituted the first wave of Russia's oil industry restructuring. But as that process draws to a close with the recent publication of a presidential decree, the country's oil barons are busy rationalising their assets and facing up to the future.

How they fare will help mould the form of Russian capitalism and may have a decisive impact on attempts to stabilise the country's economy in the immediate future. The speed of the transformation could also influence the world industry, uncertain as to whether the Russian companies will use their vast reserves to become production powerhouses or whether their inefficiencies will undermine their ambitions.

"If we are to diversify the sources of oil and gas in the world over the next 15 to 20 years, then Russia is a prime opportunity," Ms Hazel O'Leary, the US energy secretary, told the International Energy Agency in Paris last month.

The presidential decree, which slotted the final pieces of the industry jigsaw into place, determined that Rosneft,

Russian and western oil producers



the giant state holding company which acted as a "hospital for sick companies" but retained some other special privileges, should be turned into a joint stock company and privatised. The alternative proposal to retain Rosneft as a national champion, such as Saudi Arabia's Aramco or

"Russian oilmen may well end up terrifying the hell out of a lot of western oilmen who have treated them with contempt"

Mexico's Pemex, was rejected.

Mr Charbel Ackermann, vice-president of Boston Consulting Group, the management consultants who advised the Russian ministry of fuel and energy on the restructuring, says: "The discussion about the industry's structure has been resolved in favour of a privatised solution. You now have a group of privatised companies competing with each other, jealous about their margin for manoeuvre and in favour of a reasonably free working market."

But Mr Ackermann stresses that there will need to be substantial change at every stage in the oil producing, refining and marketing chain if the vision of an effective and efficient industry is to be realised.

Russia's oil companies desperately need to modernise their infrastructure, reverse the collapse of output - which has fallen by 47 per cent since peak production of 870m tonnes in 1987 - and act to

close marginal refineries to boost profitability. Those that remain need to produce lighter fuels for consumer use, rather than the heavy industrial fuels for which demand is falling.

It also needs to invest in marketing and sales through a network of petrol stations. While the US boasts 170,000 gas stations, Russia has just 9,000, according to BCG's estimates.

Some foreign companies which have been reluctant to enter into large-scale oil production deals may be more keen about downstream opportunities. British Petroleum, for example, is seeking its first service station site in Moscow. But the economics of the oil industry are still unattractive in spite of reforms. With rampant inflation, a penal tariff regime and artificially low domestic oil prices there has been almost no incentive to invest.

Some western oilmen, fed up with trying to strike deals in Russia, predict a cataclysmic

outlook for the industry which they say is heavily criminalised and grossly inefficient. Russia, they say, may even become a net importer of oil if output continues to fall, infrastructure deteriorates further and domestic consumption starts to revive.

Perhaps the most decisive element will be how quickly Russia can liberalise the industry.

In practice the relations between state and industry are intimate and intertwined. For example, Mr Yuri Shafarik, the minister for fuel and energy, was formerly a general director of a Siberian oil concern which now forms one of Lukoil's three chief oil producing units, and still sits on the parent company's board.

At times, Russia's oil companies appear to pursue an assertive policy designed to ensure it gets a piece of the action throughout the former Soviet Union. It recently secured a 10 per cent equity stake in the Azerbaijan deal.

"The decisions taken recently by the privatised companies suggest they each have a clear agenda rather than being part of a governmental cartel," says Mr Ackermann. Lukoil has big plans. It intends to raise a \$300m convertible bond soon and is aiming to raise several billion dollars by selling 15 per cent of its equity on international markets next year.

Thus companies now have more than just the state and employees to worry about. Their new constituencies include customers, competitors, shareholders and regulators.

"If these managers can keep the show on the road when they are facing very conceivable type of problem then just imagine what they can do when things are running for them," says one oil consultant. "They may well end up terrifying the hell out of a lot of western oilmen who have treated them with contempt."

A western oil expert is more cautious: "Russia's oilmen have done a lot of fast talking about what they intend to do but we shall now see whether they can deliver."



President Yeltsin laying a wreath at Pushkin's statue in Moscow yesterday to mark the anniversary of the poet's birth. *Reuters*

Yeltsin delays over outspoken general

By John Thornhill in Moscow

President Boris Yeltsin has referred General Alexander Lebed's resignation letter to a group of senior government ministers for their consideration.

Mr Yeltsin's measured response to the resignation threat from the controversial commander of Russia's 14th army emphasises the political sensitivities surrounding the popular officer, who is thought to be considering entering the presidential race next year.

Gen Lebed has established a reputation as a firm upholder of law and order in the troubled Dnestr region of the former Soviet republic of Mol-

dova. Gen Pavel Grachev, Russia's defence minister, has already accepted the resignation of the controversial general, who has been a critic of the Chechen campaign.

But Mr Yeltsin has now asked Mr Oleg Lobov, secretary of the influential Security Council, and Mr Andrei Kozyrev, the foreign minister, to assess the resignation and the situation in Moldova.

Gen Lebed, who disagrees with plans to withdraw the 14th Army from the Dnestr region, has said he would enter politics if he left the army - although he has not formally declared his presidential ambitions.

EUROPEAN NEWS DIGEST

Sweden's repo rate rises again

Sweden's central bank, the Riksbank, renewed its battle against a rising inflation rate yesterday by lifting short-term interest rates by a quarter of a percentage point.

The move, welcomed by the markets, came after Swedish inflation rose 0.7 per cent in April, pushing annual inflation above the bank's 3 per cent inflation ceiling to 3.3 per cent.

The increase in the bank's key repo, or repurchase rate, to 8.66 per cent from 8.41 per cent means short-term interest rates have risen by more than a percentage point since February.

The bank said the latest rise was necessary because high capacity utilisation and the weak krona threatened to stoke inflation further. Bond yields have stayed high and the krona weak because markets are not convinced the country is doing enough to tackle its large deficit and stabilise state debt.

A further SKr16bn (\$2.2bn) of new savings and tax increases are expected to be outlined on Monday when Mr Goran Persson, finance minister, presents plans to meet the convergence criteria for the final stage of European monetary union. *Christopher Brown-Humes, Stockholm*

EU agrees databases draft law

European Union internal market ministers yesterday agreed on a framework for the legal protection of databases aimed at combating piracy and unauthorised use of information.

The draft directive is geared to protect database creators as well as investors and to harmonise widely different legal systems throughout Europe. Only the UK and Ireland offer full copyright protection on all databases. A European Commission official said the EU needed to provide a well-defined level of protection to ensure an attractive environment for investment by the fast-growing database industry. The European Publishers' Council said the draft directive introduced protection against "unauthorised use of databases where none exists in". *Caroline Southey, Luxembourg*

Norway forces end to pay strike

The Norwegian government yesterday ordered arbitration in a pay dispute that would have grounded more than 500 domestic and international flights today by Scandinavian Airlines System (SAS) and the domestic carrier, Braathens.

The labour minister, Mr Gunnar Berge, told Norwegian television the strike, which also affected hospitals and other sectors, was damaging to society at a time of serious flooding in parts of the country.

Mr Arne Sognvold, leader of the Association of Professional Employees, said he was disappointed the government had intervened. He said the week-long strike at hospitals and schools would end as soon as possible. It was to have expanded today to include air traffic controllers. The government at the weekend forced 2,500 striking police back to work to help in the floods. *Reuters, Oslo*

Italian ex-minister arrested

Mr Antonio Gava, Italy's former interior minister, was arrested yesterday for alleged corruption, the second time he has been detained in the past nine months.

Police arrested Mr Gava, interior minister from 1988 to 1991, at his home in Rome at the request of prosecutors in the town of Torre Annunziata, south of Naples. Mr Gava, 64, a former Christian Democrat, is accused of taking a 1,500m (\$185,000) bribe for awarding a contract to rebuild a hospital destroyed in the 1980 earthquake. *Reuters, Rome*

Chirac and Santer set agenda

The French president, Mr Jacques Chirac, and European Commission president, Mr Jacques Santer, agreed yesterday on the main issues for this month's European Union summit at Cannes, according to Mr Chirac's office. The pair met for the first time since Mr Chirac assumed the presidency in May to discuss the forthcoming Group of Seven and EU summits.



French president Jacques Chirac welcoming European Commission president Jacques Santer to Paris yesterday

Mr Chirac's office said they agreed the EU should discuss plans for next year's conference on reform of EU institutions, launching trans-European transport projects as part of an economic growth initiative, funding for EU aid to eastern Europe, the Mediterranean and the third world; the future of EU broadcasting quotas; the path towards Emu. Mr Chirac has invited EU leaders and Mr Santer to dinner in Paris on Friday to discuss the Cannes summit. *Reuters, Paris*

ECONOMIC WATCH

Greek inflation falls to 9.8%

Greece's annual inflation rate dropped to 9.8 per cent in May but is not expected to fall further until August, the Economy Ministry said yesterday. The rate declined to 9.9 per cent last month, the lowest for 22 years. Lower food prices in June and July are expected to be offset by price increases for transport and public utilities. Electricity prices and domestic air fares are due to rise by an average 7 per cent in July. As part of efforts to bring inflation below 8 per cent by the year-end, the Trade Ministry has stepped up measures against profiteering by fruit and vegetable wholesalers, who increased their prices last year by an average 30 per cent. Greek families spend more than 40 per cent of their income on food and sales of fresh produce soar during the summer. The drachma is forecast to decline by only 3 per cent this year against the Ecu. *Karin Hope, Athens*

■ Norway recorded a current account surplus of Nkr2,908bn (\$466m) in March compared with a surplus of Nkr1,432bn a year earlier, the Central Statistical Bureau reported.

■ Romania's current account deficit jumped to \$433m at the end of March from \$165m at the end of February and \$93m in the first quarter of 1994, the central bank said.

■ Finland's current account in April showed a surplus of FM700m (\$162m), up from a revised FM100m in March and compared with a FM300m deficit a year earlier, the Bank of Finland said.

Czech central banker's exchange rate warning

By Vincent Boland in Prague

The governor of the Czech Republic's central bank yesterday called for a change in the government's fixed exchange rate policy to curb inflows of speculative foreign capital and to help reduce inflation, which is stuck at just under 10 per cent and shows little sign of falling.

Mr Josef Tosovsky, the central bank governor, said the government's commitment to a fixed exchange rate had attracted some \$3bn in speculative capital since the beginning of the year, swelling the money supply and keeping inflation high. While some of the inflows can be absorbed by the economy, "too much is too much, quite frankly," he told a Financial Times conference on investing in the Czech Republic.

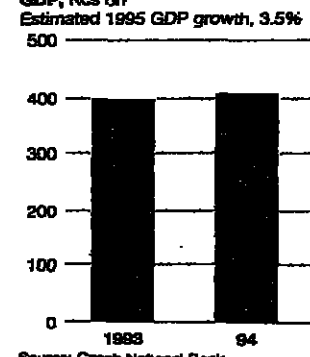
"It is not possible to have a fixed exchange rate and a financially open economy," Mr Tosovsky said. "You have to give up one of these."

If the fixed exchange rate is to be maintained, he warned, economic policy would have to change to reduce aggregate demand in the economy, provide official support for exports and allow for the creation of budget surpluses.

Speculative foreign capital is attracted to the Czech Republic by high interest rates and inflation differentials relative to countries such as Germany and the US. The managed exchange rate, resulting from the fixing of the Czech koruna against the D-Mark and dollar,

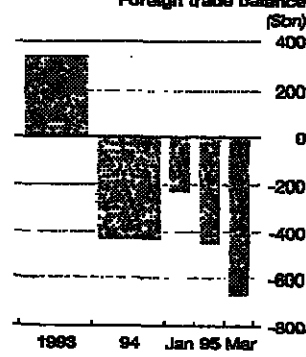
Czech Republic

GDP, Kcs bn
Estimated 1995 GDP growth, 3.5%



Source: Czech National Bank

Foreign trade balance (\$bn)



Source: Czech National Bank

eliminates the exchange rate risk of repatriating that capital, giving huge profits to some speculative investors.

The speculative inflows resulting from exchange rate stability push up the money supply and hamper the central bank's attempts to reduce inflation.

Mr Tosovsky said the economy was no longer able to absorb these inflows and that the bank was running out of options to neutralise them. "More stability leads to more inflows," he said.

The central bank governor ruled out an early floating of the koruna but said that "sooner or later we will have to think about a more market-oriented exchange rate."

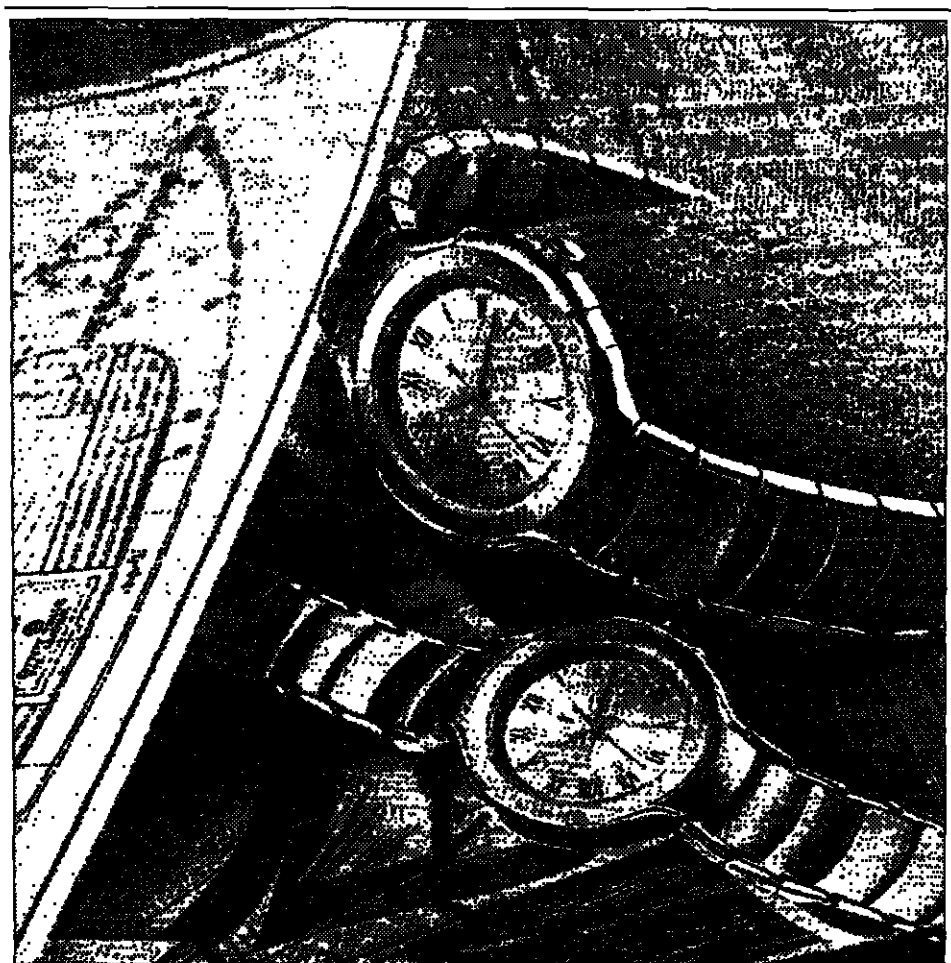
The central bank is preparing for full convertibility of the currency for current account transactions and partial convertibility for capital account

transactions. A new foreign exchange law introducing these measures is expected to be in place by the final quarter of the year.

However, Mr Vaclav Klaus, the prime minister, has said the government remains committed to a fixed exchange rate.

The real appreciation of the koruna against the currencies of the country's main trading partners, as a result of that policy, is eroding the country's competitiveness. Exports grew by only 5 per cent in the first four months of this year, while imports of consumer goods soared on the back of strong domestic demand.

Mr Tosovsky said he expected the trade deficit to reach around \$1bn by the end of the year, while continuing high revenues from tourism should leave the capital account in credit.



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Votes cast Italians into confusion

Robert Graham steers a course through the issues confronting the electorate in Sunday's referendums

Italy's 12 referendums

- ★ **UNION REFORM**
Remove restrictions on union representation in public and private sectors (three referendums).
End union contributions automatically deducted from pay packets.
- ★ **TELEVISION**
Restrict TV ownership to one channel.
Cut advertising slots during prime time.
End advertising monopolies.
Allow Rai, state TV, to be privatised.
- ★ **RETAILING**
Liberalise shopping hours.
Cut red-tape in commercial planning permission.
- ★ **CRIME**
End state's use of house arrest outside criminal's home town.
- ★ **VOTING**
Revoke second round run-off voting in local elections.

If the referendum is meant to be the simplest form of direct democracy, the Italian electorate has been led a sorry dance.

This Sunday, Italians are being asked to vote on no fewer than 12 different referendums. Proposed by a series of different political alliances and pressure groups, the subjects range from the obscure and marginal to important issues with highly sensitive political content.

The most marginal question asks whether the state should be allowed to send members of the Mafia into house arrest outside their normal area of domicile. The most political is clearly that concerning the future of commercial television, which directly affects the personal fate and media empire of Mr Silvio Berlusconi, the former prime minister.

In between, the voter is being asked to decide on arcane matters of trade union representation and the controversial issue of liberalised shopping hours. The scope of these referendums is so vast as to pose serious questions about whether any western democracy should allow such disparate issues to be lumped together and decided upon in a single day.

Italian referendums are by

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nature abrogative and thus voters are being asked whether or not laws should be abolished. However, since the Italian legislative process is complex, the same complexity is foisted on the voter.

One of the referendums refers to three different laws, two decrees and 17 separate articles, making the question an incomprehensible 500 words long. A serious voter would need to consult a barrow-load of statute books.

Not surprisingly, polls suggest a high degree of confusion among the public. People are often unsure which of the two alternatives (Yes/No) will achieve the result they wish to endorse.

Confusion is heightened because the same political party may be calling for a vote of Yes on some issues and No on others.

For instance, Mr Berlusconi's rightwing alliance is seeking a No vote to defend the existing ownership structure of commercial television but a Yes for ending certain union privileges. However, the Berlusconi camp's campaign posters rely on a big No, which refers only to television.

Public awareness is greatest

on the four referendums concerning television. An alliance of centre-left parties is behind three referendums intended to limit ownership to one channel, reduce the amount of time occupied by advertising slots during television films and ensure no one group can control the advertising for more than two channels.

If these are accepted, a significant shake-up of television ownership will occur, with Mr Berlusconi losing two of his three channels – probably without compensation.

The fourth television referendum, promoted by the Radical reformers of Mr Marco Pannella, would allow the privatisation of the Rai state broadcasting network.

The aim here is to reduce the political control of state television by bringing in private capital. If Mr Pannella wins, it will increase the chances of a complete overhaul of public and commercial television.

Other referendums could bring significant changes. The Radicals are behind a move to overturn two-year-old legislation that introduced a second round run-off in local elections in towns of more than 15,000 inhabitants.

The run-off system has proved highly effective in producing stable majorities in local government – but mainly to the benefit of the better organised left. The

Radicals are also using this referendum to head off the left from introducing a French-style second round in national elections.

Mr Pannella is also behind a very political move directed against the trade unions. This seeks to stop the practice whereby employers deduct union contributions automatically from pay packets. Ending this practice sounds innocent enough; but the Radicals believe that union membership benefits artificially from this passive support.

Efforts to reach a legislative solution in advance were

One of the referendums refers to three laws, two decrees and 17 articles, making the question 500 words long. A serious voter would need to consult a barrow-load of statute books.

blocked by Mr Berlusconi's rightwing alliance. The unions have treated the move as a declaration of war and will not take defeat lightly.

Three other referendums on trade union matters, backed by an odd mix of groups, are designed to break the dominance of the three main confederations in labour representation. However, it is doubtful that even with the passing of these referendums the power of the three confederations would be seriously dented.

For the consumer, an important development would be approval of a proposed liberalisation of shopping hours. This would open up Sunday shopping even further and end the tightly controlled week-day opening and closing hours.

Small shopkeepers fear this would be the beginning of the end of an entire class of trader, who has managed to survive better in Italy than elsewhere – thanks to protective laws. They fear this referendum, coupled with another cutting

red tape in planning permission in the retail sector, would also encourage supermarkets in the suburbs and destroy town centres.

The final referendum is also a quality of life issue. This is an attempt to end the practice whereby the state can impose house arrest on Mafia suspects in areas distant from their normal domicile.

The practice has led to the importation of unsavoury characters and organised crime into tranquil neighbourhoods. But anti-Mafia police defend the weapon as a useful way of controlling movements of dangerous suspects.

According to the Liberation newspaper yesterday, French defence experts will propose a final series of less than 10 tests, aimed chiefly at calibrating instruments and methods for future laboratory simulation of nuclear explosions. This would allow Mr Chirac to announce the end-date of the new tests at the same time that he announces their resumption, a move designed to minimise protests from Pacific countries and to put France in

Berlusconi TV channels win sanctions delay

By Robert Graham in Rome

The imposition of sanctions for political bias on the three television channels of Mr Silvio Berlusconi's Fininvest empire was postponed yesterday to the relief of all. The matter could now be delayed even until after Sunday's referendums on the future of commercial television.

Sanctions were imposed last week by the media watchdog commission following complaints that the Fininvest television channels were carrying excessive propaganda for their own cause, defending the continued ownership of three television channels.

Fininvest was given until yesterday to comply with a demand to run 13 free spots campaigning for limiting ownership to one channel. Failure to do so risked anything from a fine to a 15-day black-out.

The decision was postponed yesterday ostensibly because Mr Berlusconi's supporters on Monday filed a challenge in a Milan administrative court to the media watchdog's ruling. The court is not expected to pronounce until Thursday and then may decide the matter should be treated by a Rome court.

However, the media commission has been made aware that a black-out of Mr Berlusconi's television could have a serious influence on public opinion at a crucial juncture. The Berlusconi camp have made little

secret that their refusal to comply with the ruling is intended to raise the stakes and create the impression they are being victimised.

In another delaying move Mr Berlusconi's supporters filed a formal complaint against the media watchdog for itself showing bias. An action lodged with a Rome court claimed the commission had failed to take heed of complaints that a local television station was broadcasting propaganda in favour of Mr Berlusconi having his share of the commercial TV market cut.

Mr Berlusconi himself has repeated on several occasions that the commission is prejudiced against him and is doing its best to penalise Fininvest. Mr Berlusconi's channels account for 45 per cent of the national television audience share, control more than 85 per cent of commercial advertising.

He and his supporters have so far failed to mention the need to observe a constitutional court decision in January. This ruled that the 1990 law reorganising state television and the ownership of private channels was unconstitutional. It went on to order him to divest at least one channel by 1996. It is still unclear how this decision, which must be obeyed, will be squared if the Berlusconi camp emerges victorious on Sunday.

France faces confrontation over Pacific nuclear tests

By David Buchanan in Paris

Greenpeace, the environmental lobby group, yesterday announced plans to send its Rainbow Warrior boat to the South Pacific next week to try to deter France from resuming nuclear weapon tests in the region.

For his part, Mr Charles Millon, France's new defence minister, stressed yesterday that military experts had recommended resumption of nuclear

tests, which were halted by former President François Mitterrand three years ago.

The military recommendation, to which Mr Millon referred yesterday, was given to Mr Mitterrand, who ignored it in the interests of setting a moral example to other countries. But President Jacques Chirac is shortly to receive a report from the same group of military experts, and is expected to need no urging to follow their advice that France needs

a few more live tests before turning to laboratory methods of keeping its arsenal up to date.

The stage is set therefore for renewed confrontation between the French government on the one hand and environmentalists and Pacific states on the other. This took a significant turn 10 years ago when two French secret service agents blew up Greenpeace's first Rainbow Warrior boat in New Zealand's Auckland harbour, killing a Portuguese journalist. The agents were eventually deported back to France where, despite protests from New Zealand and Australia, they rejoined their service and wrote their memoirs.

Greenpeace said yesterday that Rainbow Warrior II would set sail from Auckland on June 13 with a 20-strong crew of French and other nationalists. Others will join the ship later, including Monsignor Jacques

Gaillet, the radical French Catholic whom the Pope recently removed from his Evreux bishopric.

The organisation gave no details of the planned voyage to near the French underground test site on the remote Mururoa atoll, but pointed out that past protest voyages had been instrumental in persuading France to abandon atmospheric tests in 1972 and in halting underground tests in 1992.

According to the Liberation newspaper yesterday, French defence experts will propose a final series of less than 10 tests, aimed chiefly at calibrating instruments and methods for future laboratory simulation of nuclear explosions. This would allow Mr Chirac to announce the end-date of the new tests at the same time that he announces their resumption, a move designed to minimise protests from Pacific countries and to put France in

a position to sign any total test ban treaty emerging in 1996 on negotiations in Geneva.

In one of its last acts, the former Balladur government gave the go-ahead to the start of construction next year on a FFrbn (\$1.2bn) "Megajoule" giant laser near Bordeaux. This is part of a joint US-French programme to replicate the power released by a nuclear explosion, thereby simulating the effect of an atomic weapon being detonated.

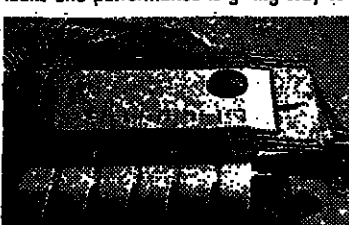
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Under the skin of the model changes, which mark progress in the automobile industry, a more fundamental shift in thinking is taking place.

Consumer expectations are causing car makers to redefine their product. In trepid-setting markets, emphasis on looks and performance is giving way to



Modern engines like the Volkswagen 5 cylinder 24 valve power unit are critically dependent on high quality components with KEVLAR.

new criteria – comfort, efficiency, reliability and, above all, safety. Designers are being challenged to build in more of each at every point in the model range.

DuPont's engineering fibres are playing an increasingly important part in this process.

NYLON that saves lives

For example, in airbag technology DuPont has been active in the development of passive restraint systems since the early 1970s. By the year 2000, almost all new cars are expected to have them.

State-of-the-art airbags made from high-tenacity industrial NYLON inflate on impact, then deflate to absorb crash energy – all in a split second. At the

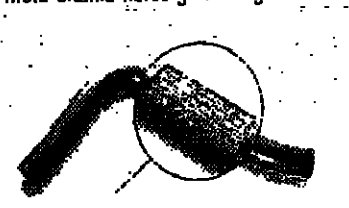
moment of inflation, airbags contain up to 90 litres of gas. Failure is unacceptable: there are no second chances for this component.

The special NYLON yarns DuPont has developed meet exacting specifications, but save weight and enable a 20% reduction in pack space – advantageous to designers, engineers, and ultimately drivers and passengers.

Fail-safe hose technology

DuPont materials help in other ways. Modern engines perform most efficiently at high temperatures – the higher the better. So the mechanical and heat stress on components in and around today's power units is much greater. Engine bays are not only hotter, they're more crowded, limiting access to many components. This increases the reliability stakes: failure is not just inconvenient to drivers, it's time-consuming and costly to put right.

KEVLAR para-aramid and NOMEX meta-aramid fibres give designers the



Flexible hoses for turbochargers on heavy trucks are reinforced with NOMEX to resist temperatures up to 200°C.

freedom of more demanding specifications for key components such as hoses.

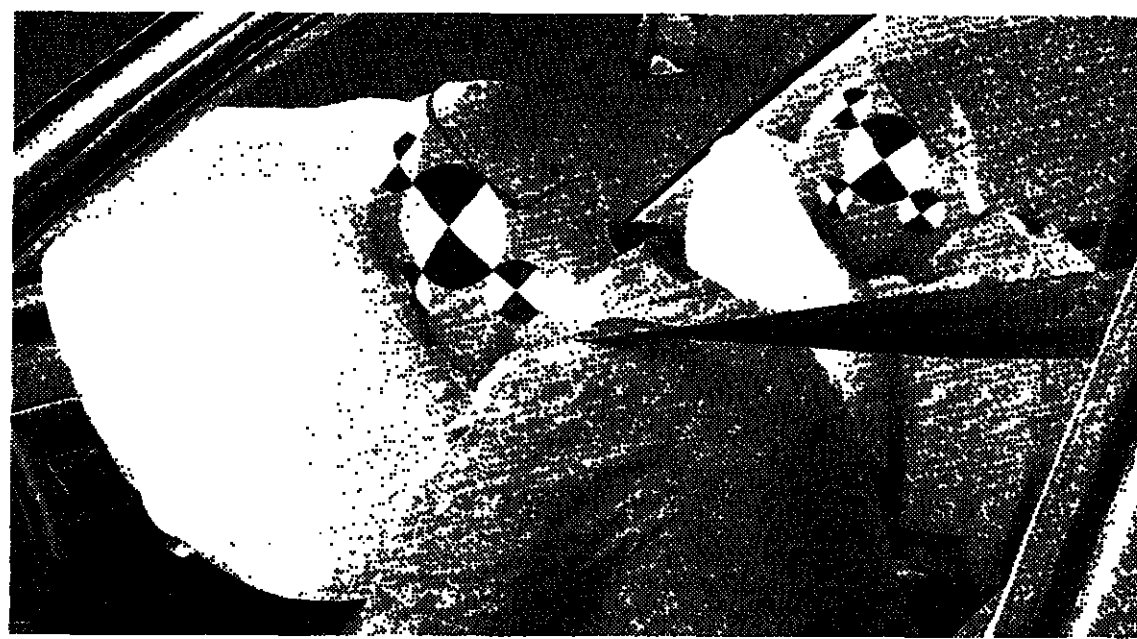
The industry's ultimate objective is fail-safe products with a guaranteed service life. Manufacturers such as Continental, Gates, Hutchinson, Metzeler, Phoenix and Saeg are well on the way to achieving this, using KEVLAR and NOMEX to reinforce water, oil, fuel and hydraulic hoses. These set the industry standard for durability and dimensional stability, especially when things get hot. KEVLAR resists temperatures of up to 160°C, and NOMEX 200°C, without functional alteration.

KEVLAR takes the friction

Other component suppliers, such as Goetze, Klinger and Reinz, have adopted KEVLAR as a superior, environmentally-friendly alternative to asbestos for heavy-duty cylinder head gaskets. Despite higher compression ratios and increased cylinder head temperatures, failure of this key component is rare.

Engine performance gains have been matched by all-round improvements in handling and braking. KEVLAR in brake linings delivers smoother, more efficient stopping power in all road and weather conditions, adding to the safety margin and driver comfort.

Linings also last longer and cause less wear to discs and drums, so saving



DuPont pioneered airbags in high-tenacity NYLON. Passenger bags covered in TYVEK behind a "door" in HYTREL® minimize weight and space requirements.

on service costs. The same qualities make KEVLAR a natural choice to reinforce clutch linings, too.

High performance where it's needed

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KEVLAR and NYLON add capability to most modern tyre designs

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ZYTEL-KEVLAR is used by Toyota for door check bars, by the Automotive Products Co. for clutch activation systems, and by other manufacturers

for a wide range of gears, bushes and bearing applications.

All-in-all, DuPont materials are an integral part of millions of cars rolling off Euro-production lines at Audi, BMW, Fiat, Ford, Lancia, Mercedes-Benz, Opel, Peugeot, Saab, Toyota, Renault, Volvo and Volkswagen. The list of applications gets longer each year – hardly surprising, given the extensive use of KEVLAR and NOMEX in motor racing and rallying, proving ground for most of the industry's advances in materials technology.

DuPont innovation

The ability of car makers to continue to meet your expectations for increased comfort, efficiency, reliability and safety – and respond to environmental concerns – is critically dependent on new and even better materials. DuPont is committed to their development: the innovative drive behind our engineering fibre products continues.

DuPont is one of the world's leading industrial companies, with 40 production and development facilities in Europe alone, and over \$1.3 billion spent annually by its R&D and customer service laboratories worldwide. KEVLAR,

NOMEX and NYLON are produced by DuPont Engineering Fibres which also developed TEFLON® and CORDURA®.



KEVLAR and NOMEX are present in motor sport, from strong, lightweight bodyshells to drivers' flame and heat resistant overalls.

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Rubin calls for closer IMF surveillance

By Jurek Martin in Washington

The international financial system needs better emergency funding mechanisms and closer surveillance by the International Monetary Fund to handle crises on the scale recently encountered by Mexico, according to Mr Robert Rubin, US Treasury secretary.

There is a new isolationism afoot (in the US) and it must be aggressively countered. He identified four areas for action "to deal with the problems that may arise from the vast increase in the speed and size of the international financial markets".

● Greater and more timely disclosure of financial data to the markets: that was "one of the primary lessons of Mexico's difficulties." The IMF "must develop a greater capacity for surveillance, so that it, too, can play a powerful preventative role".

● The international economy needs new mechanisms "to rapidly mobilise relatively large amounts of conditional financial assistance". Since the US, "cannot be the lender of last resort to the world," the multinational institutions needed extra capacity.

● There should be "cautious exploration of orderly work-out mechanisms" to handle international debt crises. "We no longer have the luxury of bringing in a few major creditors to find a solution," he said, suggesting that a "broader range" of countries be involved.

● The financial markets themselves, and their evolving instruments, need closer supervision, with national regulators working more closely with each other. "We cannot eliminate this type of systemic risk, but we can better monitor and limit it."

Mandela backs unions' labour law campaign

By Roger Matthews in Johannesburg

More than 50,000 protesting trade unionists received the personal blessing of President Nelson Mandela yesterday when they marched through central Johannesburg in the biggest display of political strength since last year's general elections.

allied to the ANC, and played a key role in the election victory. It was widely expected that its militancy would inevitably create some cooling of relationships with a cabinet committed to fiscal discipline, wage restraint, and the fight against inflation.

However, ANC ministers have said privately that they were conscious of growing militancy at the grassroots, and Mr Mandela's intervention yesterday may have been in recognition of that.

The president's involvement will also intensify pressure on employers during negotiations with labour and government representatives at the National Economic Development and Labour Council (Nedlac). The three sides are seeking to reach a common position on a draft labour relations bill, which would then be adopted by the cabinet and presented to parliament for approval.

The union protest campaign has been sparked by the employers' lack of enthusiasm for the introduction of centralised bargaining, by differences over the right to strike and to impose lockouts, and over the role of workplace forums which would offer workers greater involvement in the running of companies.

Banks 'face new competitors'

By John Gapper in Seattle

Banks may be forced to sell products such as mortgages and credit cards more cheaply over electronic networks than through their branches to avoid being undercut by new competitors. Lord Younger, chairman of Royal Bank of Scotland, told an international banking conference in Seattle yesterday. Technological change threatened banks' ability to retain dominance of their core businesses.



Younger: 'technological threat'

He told the International Monetary Conference that new technologies such as telephone and electronic networks would allow companies which were not banks to sell products such as credit cards and loans more cheaply.

However, he said most customers were not ready to conduct their business over the Internet or through interactive video, and evolution towards the bank of the future would depend on customer demand.

Banks could "find it hard to respond to this threat because of their substantial investment in branches, infrastructure and people".

Although telephone delivery of services was already taking off, Lord Younger said other developments would take time "and may require a new generation of young, computer-literate customers" to succeed.

New channels such as automatic teller machines, telephones, screen phones and interactive video would give customers quicker access to information and produce "the illusion of personal service".

Royal Bank allowed Direct Line to compete with its branch network in selling products. "This means that we may lose some business, but we would rather lose it to our own subsidiary," he said.

Widespread applause greets the fall of the Kenya shilling

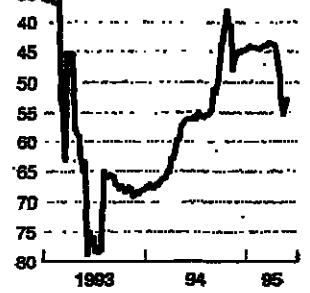
By Michela Wrong in Nairobi

"Where will it stop?" was the jittery headline in a local magazine, reflecting the panic many felt as Kenya's currency went into a headlong dive, losing 28 per cent of its value in just two months. But the dismay was not universal. Flower growers, coffee sellers, tour companies, restaurants and hotels are all reeling in the shilling's dramatic slide and hoping for a further fall.

The sudden depreciation, which has brought the shilling down to between 50 and 55 against the US dollar, puts an end to an anomalous seven-month period in which the currency was trading at between 42 and 45 to the dollar. The over-strong shilling was largely the result of a flood of speculative foreign exchange into Kenya that followed the lifting of exchange controls in 1992, chasing high yields on Treasury bills.

The government tolerated this since it made it easier to pay off foreign debt. But the effect was catastrophic for the country's main earners of foreign exchange: a tourism industry that brings in \$350m a year, the coffee and tea sector and Kenya's most recent success story - the flower, fresh fruit and vegetable sector.

The latest depreciation is the result of a combination of factors: the dollar's strengthening on international markets, reduced foreign exchange com-



Source: Datastream

ing into the country during the low tourism season and the depressive effect of press reports that Kenya's bilateral donors are unhappy with the government's record on democratisation and could cut aid. Speculation exacerbated the movement, with importers rushing to pay their foreign currency bills before the shilling lost more ground and exporters holding on to their proceeds in the hope the shilling would fall further.

With the strong shilling, Africa's leading tourist destination was transformed from a cheap to an expensive holiday. "We used to stand head and shoulders above the rest," said Njeru Kiria, chief executive at Kenya's Association for Hotel Keepers and Caterers. "Suddenly we were losing our competitive edge against South Africa, Florida, south-east Asia."

If the shilling had remained strong, Mr Kiria said, hotels would have been forced to close as many of the 850,000 visitors a year looked elsewhere. As it is, many establishments are just ticking over, with occupancy rates of only 40 per cent, and hundreds of employees have been laid off.

The strong shilling also whittled away at the profits of coffee and tea producers, Kenya's main exporters. Mr Jimnah Mbari, chairman of Nairobi's stock exchange, attributes profit falls of more than 50 per cent at blue-chip companies

such as Brooke Bond Kenya, Sasini Tea and Coffee and Limuru Tea in 1994 directly to the over-strong shilling.

"Eventually a 60 shilling rate would be more appropriate," said Mr Mbari. "But 55 to the dollar now should reassure the agricultural sector."

For the fruit, vegetable and horticulture sector, the effect was a sharp brake on what had been a rapidly-expanding industry in which enterprises mushroomed to more than 300 from 100 in just a few years.

"The period of rapid growth is past," said Mr Paul Gnetette, who works for the US-funded Kenya Export Development Support project. "Companies are now going to have to become more efficient or close."

Vegetable growers, which have the smallest profit margins, were worst hit. But even flower growers, bolstered by higher profit margins, suffered acutely.

"When the shilling was weak we gave five wage increases to our employees because they were struggling," said Mr George Roy, financial director for Homegrown, largest supplier of flowers to Britain's Marks and Spencer. "When the rate goes down you can't just take that away. Across the board our cost of production rose 100 per cent."

Many exporters would like to see an even weaker shilling, trading at 60 to the dollar, but the overwhelming message from the export industry, Mr Micah Chesere, central bank governor, acknowledged, is that currency stability is more important than the rate. Over the last two years the shilling has soared from a high of 82 to a low of 35 to the dollar.

The risk of a weaker shilling is, of course, inflation, as the higher price of imports gets passed on to consumers. But Mr Chesere insisted his target of 7.2 per cent inflation for 1995 remained feasible and predicted petrol companies which recently angered the government by raising prices would lower them.

"When the shilling was strong importers did not lower their prices accordingly. People were overcharging and enjoyed bumper profit margins. The importers knew they were living on borrowed time."

S Africa abolishes the death penalty

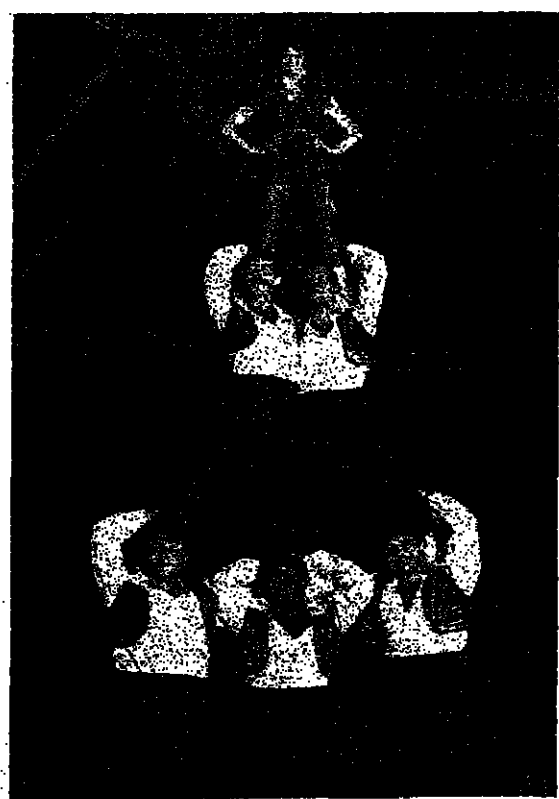
South Africa's powerful constitutional court yesterday abolished the death penalty, ruling that capital punishment was incompatible with the right to life enshrined in the country's bill of rights, writes Roger Matthews. The court president, Judge Arthur Chaskalson, said: "Everyone, including the most abominable of human beings, has the right to life and capital punishment is therefore unconstitutional."

judges had been widely expected, given their known views on capital punishment. But it will cause controversy in a country where an average of 50 people were murdered every day last year, the highest national rate in the world.

Opinion polls show a majority of the public favour keeping the death penalty. The cabinet has been divided; the African National Congress favours abolition while the National party, wants the death penalty retained.

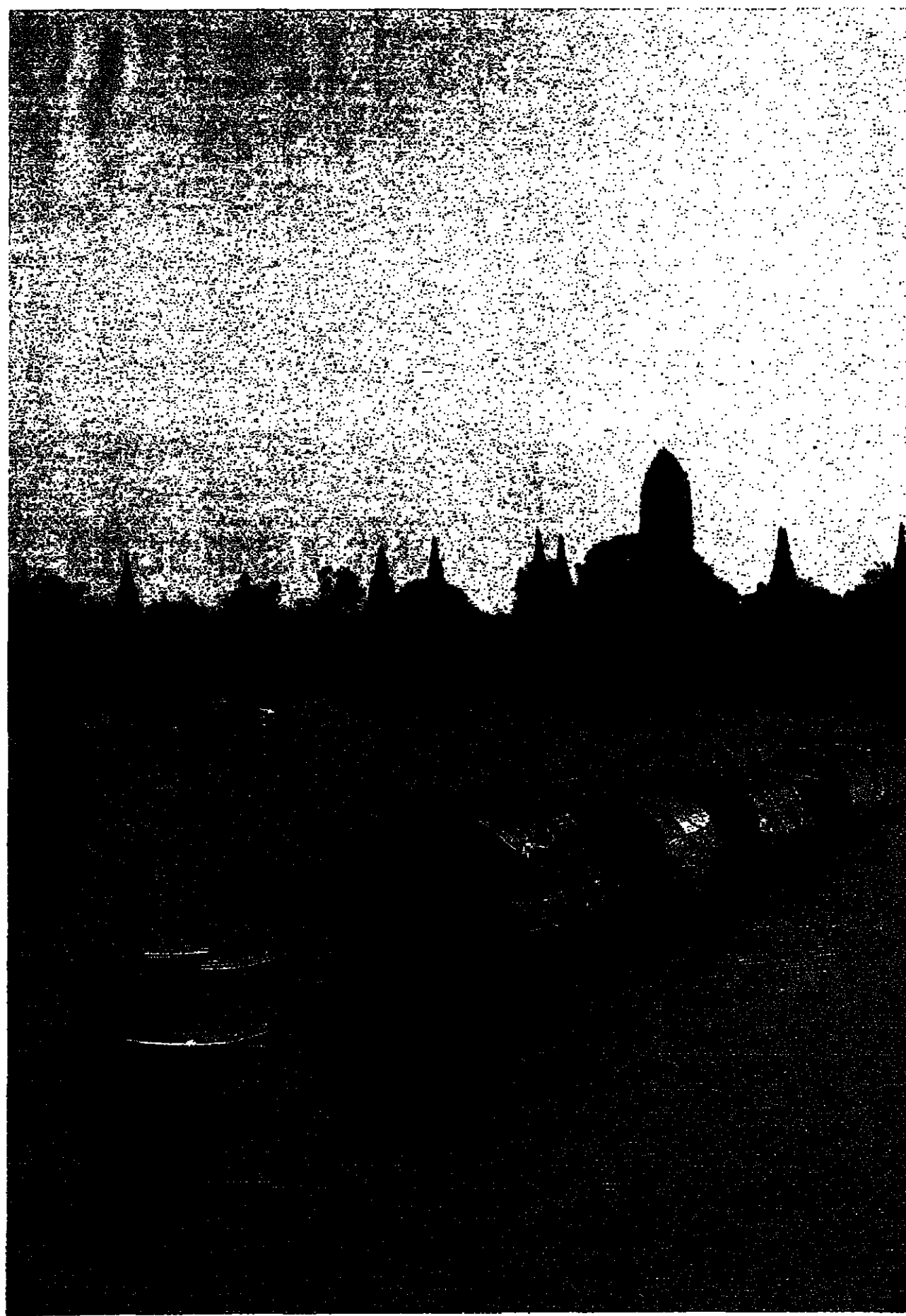
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NEWS: THE AMERICAS

Endangered species pulls off political coup in California

By Jurek Martin in Washington

Professional politicians are supposedly an endangered species in the US. But on their turf, and on their terms, they can still run rings around the new breed of amateur "citizen-legislators" who arrive breathing fire and brimstone and suddenly find themselves elegantly drenched.

The Republican Party in California, for example, is now feeling a bit wet, and very angry, courtesy of Mr Willie Brown, for 15 years Democratic Speaker of the state assembly and as skilful a

pure politician as any in the land.

On Monday in Sacramento, he pulled off his ultimate coup. The assembly duly elected a Republican to succeed him, but the new Speaker, Mrs Doris Allen, was not the party candidate but Mr Brown's. In fact she was elected with every Democrat voting for her and every Republican, except herself, against.

She then thanked her predecessor by naming him to a new post as Speaker Emeritus. She promised him a leading role in this summer's budget negotiations with Republican Governor Pete Wilson and agreed under a "power sharing"

arrangement that most, if not all, Democratic assemblymen could keep their committee assignments.

The story takes some telling. The Republicans appeared to have scored a narrow one-seat majority in last November's election, threatening Mr Brown's tenure. But he located and wooed a dissident Republican backbencher who broke with the party and kept the Speaker in power.

However, the backbencher was recalled by furious constituents and voted out of office, again setting the stage for Mr Brown's removal. He appeared to

acknowledge the inevitable by announcing he would run for mayor of San Francisco. In any event, the state term limit law obliges him to leave the assembly next year, though he had mentioned moving over to the California senate.

Having laid down his smokescreen, Mr Brown went to work on Mrs Allen. She is 59, was first elected in 1982 from conservative Orange County but was known for an independent streak and a willingness to co-operate with Mr Brown's Democratic majority. She sponsored bills requiring motor

cyclists to wear crash helmets and banning offshore gill net fishing, but was otherwise obscure.

But Mr Brown knew that she was furious with Mr Jim Brulte, the Republican floor leader in the assembly, because he had supported a Republican rival when she fought, and lost, a primary for a vacant seat in the Senate earlier this year.

Mr Brown gave her revenge on Monday. She beat Mr Brulte by 40 votes to 38 (there are still two vacancies in the 80 member assembly) to become California's first woman Speaker. Angry Republicans

immediately threatened to have her recalled, but that might take some political doing.

Mr Brulte grouched that "the least capable Republican as Speaker will be better than Willie Brown on his best day." That was a mistake, for Mr Brown had not quite finished.

Since he is the first Speaker Emeritus, no office had been assigned to him. But he has announced that he expects to move one floor upstairs from the Speaker's quarters - into the space now occupied by Mr Brulte.

Argentina holds up wages to hit IMF targets

By David Pilling in Buenos Aires

The June wages of 300,000 Argentine public sector workers will not be paid until July in an effort to reach fiscal targets agreed with the International Monetary Fund.

Hoping to compensate for disappointing tax receipts, the move is designed to meet IMF targets for the second quarter by pushing a significant proportion of the state's financial obligations for this period into the third quarter.

The wage payment delay, described by one commentator as a "cosmetic exercise," will be complemented by rescheduling public sector debts with suppliers and by bringing forward to June the payment of a wealth tax.

The combined exercise would postpone outgoings and advance tax receipts, boosting national accounts for the quarter by up to \$1.3bn.

Mr Domingo Cavallo, the economy minister, said such measures were necessary, "even though we don't like them," because tax receipts were likely to fall short by an estimated \$600m in the second quarter.

Mr Cavallo said he expected tax collection to pick up strongly in the second half of the year as liquidity returned

to the economy.

He has rejected the forecasts of many economists that growth will slip to zero or even negative levels this year, sticking to his estimate of 3 per cent.

In the previous four years, economists had consistently underestimated the strength of the Argentine economy, Mr Cavallo said. However, even President Carlos Menem has admitted that the next few months are going to be "pretty tough."

Many economists doubt the ability of the economy to pick up steam in the second half given the severe credit crunch and the consequent breakdown in the payments chain.

Even though part of the \$8.5bn that fled the system after Mexico's devaluation is beginning to trickle back, this may not immediately feed into growth.

"The partial entrance of funds will not prevent the economy from remaining depressed for at least until the end of the year," the Alpha economic consultancy said in a recent report.

Alpha, which estimates that the economy grew at 2.5 per cent in the first quarter, says Argentina will record negative growth of 0.5 per cent in the year as a whole. Last year, the Argentine economy grew by 7.1 per cent.

Mexico faces protests

By Leslie Crawford in Mexico City

Mexico's opposition National Action party (PAN) is mobilising its supporters for civil disobedience and nationwide demonstrations this week to protest against the victory of the ruling Institutional Revolutionary party (PRI) in elections for the governorship of Yucatán.

The PAN is contesting the results of the May 28 elections which pronounced Mr Victor Cervera Pacheco, the PRI candidate, the new governor of Yucatán by a margin of only 22,463 votes over Mr Luis Correa Mena of the PAN.

The PAN, Mexico's biggest opposition party, has refused to concede defeat. It is challenging the results before electoral courts and seeking annulment of the count in 325 polling stations, where it alleges irregularities took place.

The fiercely contested election in the south-eastern state of Yucatán has led to a marked deterioration in relations between President Ernesto Zedillo's government and the PAN, which previously acted as the unofficial junior partner in government.

The call for civil disobedience is unusual for the PAN, whose members are mostly conservative, Catholic and from the urban middle classes, and signals the beginning of a confrontational strategy from the party.

Hopes for Haiti poll peace recede

An election success is crucial to the establishment of democracy, says Canute James

Haiti's electoral officials are scrambling to be ready for legislative elections scheduled for June 25 amid indications that the vote, considered crucial to the country's political rehabilitation, could be damaged by administrative problems and violence.

These will be the first elections since the return of Mr Jean-Bertrand Aristide from three years in exile after being overthrown by the military in 1991. They are to fill 18 seats in the senate and the 83 in the lower house, and to elect more than 100 mayors and 500 town councillors. The exercise is seen by the Haitian government, and by the US and other countries which backed Mr Aristide's return, as important to the establishment of democracy in the Caribbean state.

The provisional electoral council, hoping to have the ballots printed in the US and returned to Haiti to be distributed in time for the vote, has dismissed suggestions from the United Nations that it does not have enough time. "The electoral council is holding elections, not the United Nations," said Mr Anselme Remy, the council's president.

He was speaking a few hours after more questions about the integrity of the elections were raised by the theft of almost 1m voter registration cards. "The aim of the thieves is to prevent people who want to vote from doing so," Mr Remy said. The cards could then be used by the thieves to put an MP or Senator of their choice into power.

The prospect of trouble-free



Jean-Bertrand Aristide: needs strong showing to support his commitment to reforms

elections has been made more unlikely by increasing violence in Haiti, and by what government and security officials say are signs that factions loyal to the former military government will use thuggery to try to disrupt the campaign.

The populist parties which make up the Lavalas (Flash Flood) movement which swept Mr Aristide to power in 1990 are expected to do best. It is most organised while other parties are generally weak.

Mr Aristide will benefit from credible elections to support his public commitment to political and economic reforms. This could appease some foreign business and will prepare the ground for the presidential

elections in December, when Mr Aristide's successor will be chosen. The president cannot stand for consecutive terms.

President Bill Clinton will also benefit from trouble-free voting in Haiti. The US government, and the UN, have provided money to organise the elections.

The US president's interest goes beyond this, however. He ignored the objections of many - even Democrats - to mount the US military intervention in Haiti which forced the country's military rulers into exile and paved the way for Mr Aristide's return. Chaos and confusion in the first real test of popular democracy in Haiti would undo Mr Clinton's work

and embolden his detractors.

The elections will also be a test for the UN multinational force in Haiti which is responsible for law and order, and for Haiti's fledgling constabulary.

There have been outbreaks of sporadic and often aimless shooting, said to have been carried out by disgruntled anti-government factions.

Trouble-free elections could also ease the growing disappointment among Haitians who feel they should already have started to see the economic changes promised when Mr Aristide was reinstated. The president intends to use the weeks after the voting to make some changes to ease their impatience. Extensive

cabinet changes are expected.

Foreign donors are putting up more than \$700m to jumpstart the economy, the weakest in the Americas. The government plans to privatise nine big state enterprises, and is implementing broad tariff reforms.

Mr Aristide's government is offering special incentives to foreign investors. They are aimed mainly at US companies, several of which were involved in Haiti's light industry before the military overthrow the president. Although some have returned, there is uncertainty among foreign business about the longer-term stability of the country.

The poor state of Haiti's physical infrastructure and utilities is also not encouraging new businesses. Most investors are willing to move after the legislative elections, provided there is administrative and political calm, while others say they will wait the outcome of the presidential election.

A rise in violent street crime not only frightens Haitians and makes the government appear helpless, but will also deter foreign investment.

The US government has offered to train more Haitian policemen in the US to curb a rise in violent crime, but Haiti will continue to need outside help to maintain law and order. The commander of the UN forces in Haiti has suggested their mandate should be extended beyond the deadline of next February when the new president is installed.

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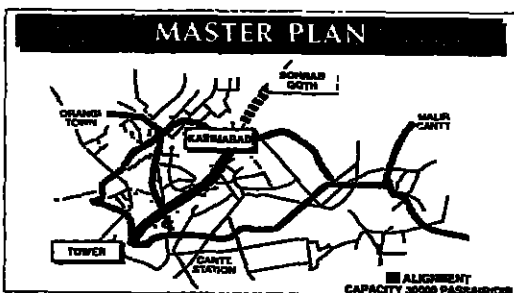
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CALENDAR OF EVENTS	DATE
EXPRESSION OF INTEREST	JUNE 19, 1995
COLLECT BID DOCUMENTS	JULY 15, 1995

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EU-Japan accord over cars access

By Michio Nakamoto in Tokyo

The EU and Japan yesterday reached agreement on measures to improve access to the Japanese markets for cars and car parts.

The agreements, reached after two days of negotiations in Tokyo, marked a "substantial breakthrough" in the area of vehicle standards harmonisation, said Sir Leon Brittan, vice-president of the European Commission.

The EU-Japan accord coincides with a trade dispute between the US and Japan over access to Japanese markets for US cars and car parts. The US has threatened to impose punitive tariffs of 100 per cent on Japanese luxury car imports unless Japanese carmakers agree to increase purchases of US-made car parts. In response to what it sees as an unjustified unilateral measure, Japan has taken the case to the World Trade Organisation.

In its negotiations with the EU, Tokyo agreed to six specific measures long requested by the EU:

- Japan will become a signatory to the United Nations Economic Commission for Europe (UNECE) 1998 Agreement, which calls for the mutual recognition of vehicle regulations.

- The UN-ECE Agreement covers 90 vehicle testing and certification standards to which member countries voluntarily adhere. Although Japan has yet to decide which specific standards it will respect, "we have had indications that Japan will adhere to a significant number of the regulations," according to Mr Richard Wright who is in charge of vehicles at the commission.

Japan's participation will help to harmonise standards between the EU and Japan and facilitate access to Japanese markets for European car and car parts makers. Japanese participation was also important since it set the pace for vehicle standards in the Asian region, Mr Wright noted.

- Japan agreed to provide European carmakers with improved access to official vehicle inspectors who issue certification to imported cars.

One European carmaker had to send 37 cars by air freight to Japan at a cost of ¥50m (\$374,000) in order to receive quick certification. Under the agreement, reached yesterday, Japan will provide a 40-day advance notice of inspectors' visits to Europe to enable car

makers to arrange inspections. ● Japan will introduce a preferential handling procedure for trucks which will enable European makers to take advantage of simplified testing and certification procedures for up to 2,000 trucks imported into Japan.

- Japan will accept the principle of component type approvals. Currently, parts makers must receive approval for individual parts each time they want to sell them to a manufacturer.

- European carmakers will be able to obtain certification of their cars made in the US for the Japanese market.

Japan has agreed to hold talks with the US on their car trade dispute on June 12 and 13 in Geneva, Minister of International Trade and Industry Ryutaro Hashimoto said yesterday.

He also said Japan would welcome the participation of the European Union in the talks which, he said, should be held under the auspices of the World Trade Organisation.

- Japan will accept European durability standards for emission regulations.

Negotiations between the two sides will continue to resolve other outstanding issues.

European carmakers welcomed the news from Japan that had agreed to change some aspects of the inspection of imported cars, saying it would help cut the costs for exporters.

An official at the Association of European Automobile Constructors said: "ACEA welcomes the progress in technical discussions."

- Sales of imported vehicles in Japan in May rose 21 per cent from a year earlier to 25,106, marking the 19th successive year-on-year gain.

The Japan Automobile Importers Association (JAIA) said. May sales of vehicles made by the overseas units of Japanese makers totalled 7,154, up 17.9 per cent on the year.

May's imported vehicle sales were a record for the month, surpassing the previous May record of 21,579 in May 1994, JAIA said.

On June 1, the Japan Automobile Dealers Association (JADA) announced that Japan's overall domestic vehicle sales had risen 3.4 per cent from a year earlier to 335,728 units in May, marking the 12th consecutive month of gains.

VW leads drive into Israel by German ventures

By Julian O'Connell in Jerusalem

Volkswagen of Germany and Israel's Dead Sea Works yesterday signed a memorandum of understanding to establish a joint venture worth up to \$600m to produce and sell magnesium.

The venture will construct a magnesium production plant near the Dead Sea. The first phase, costing \$200m, will have a capacity of 27,500 tonnes per year and production is planned to start in the second half of 1996. The second phase will double the capacity. DSW will hold 65 per cent and Volkswagen 35 per cent of the venture. Volkswagen will use much of the magnesium in the development of lightweight environmentally friendly vehicles.

The deal is the first major Israeli-European joint venture, and was hailed by Chancellor Helmut Kohl of Germany and Israeli prime minister Yitzhak Rabin as the start of investment and trade benefits of unfolding Middle East peace.

Mr Kohl, who is visiting the Middle East accompanied by a German business delegation, said yesterday's deal would be a "role model" for German and Israeli companies to form joint ventures to help cement Middle East peace.

The chancellor also promised to back Israeli demands for a conclusion to negotiations on a new Israeli-European Union trade agreement which Israel wants to be initiated at next week's EU council of ministers meeting.

Mr Kohl, stressing the growing economic and political power of Europe, said he would

back Israel's demands for greater access to European markets and research and development programmes.

"If the people of the region can't find jobs or win bread for their families then there will be no stability," he said. "We want to give an increased privileged status to the relations between Israel and Europe and later on between the EU and the region and we want to promote this significantly."

Mr Kohl said that there were "on-going negotiations on this point and as usual there are certain difficulties," but he believed they would be overcome.

Israeli officials said the chancellor's political backing could lead to Israeli cabinet ratification of the draft trade agreement with the EU today.

Israeli officials said Mr Kohl had promised to back Israeli demands for observer status on the EU's research and development committee; better access for agricultural products; and for inclusion in negotiations on competition in public procurement, especially in the telecommunications sector.

Other German companies including Siemens and Daimler-Benz said they were negotiating deals and joint ventures with Israeli companies. Mr Matthias Kleinert, a Daimler-Benz executive, said sales to Israel would more than double from DM400m last year to almost DM1bn within three years.

"Israel will be a launching pad and a power source for European companies looking at the region," said Mr Kleinert.

Safe landing at an unpopular destination

The UK-US air deal fails to address the issues the airlines care most about, writes Michael Skapinker

The aviation deal agreed this week between the US and the UK was obviously fair and even-handed, one of the participants said yesterday. Nobody likes it.

The most strident objector was American Airlines, which complained about the "inability of the US to negotiate a quid pro quo for US airlines in the UK".

Many in the industry believe American Airlines was angry because the agreement gives its rival, United Airlines, the right to fly from Chicago to Heathrow. United, while welcoming the deal, is unhappy that it has been restricted to a Boeing 787, which carries only 211 passengers.

Participants on the UK side are slightly happier, although they believe the agreement leaves them restricted in their ability to bid for US government business. They can carry US civil servants from five US cities to London, but not to points beyond, which they believe deprives them of 40 per cent of the government business available.

The European Commission will not like the agreement either. Mr Neil Kinnock, the transport commissioner, last week repeated his threat to take legal action against EU countries which negotiated air agreements with the US bilaterally. He said the Commission should negotiate for all EU countries, a position firmly rejected by the UK.

To anyone outside the aviation industry, the achievement of more than two months of negotiations between the UK and the US will appear paltry. British Airways can continue to offer a second daily flight between London and Philadelphia. United can fly between Chicago and London. UK carriers can bid for some US government business. The UK said last October that US airlines can fly to UK regional airports; the US this week said thank you.

The agreement does not deal with the issues that airlines on both sides regard as important. The UK industry wants access to the US regions. Close to a third of the 10m passengers flying between the two countries each year begin or end their journeys in cities to which UK airlines are not permitted to fly.

British Airways wants to be allowed to develop closer relations with USAir, the carrier in which it has a 24.6 per cent stake, than are currently permitted by US law. The principal US demand is to be allowed to fly freely into London's Heathrow, the world's busiest international airport.

WORLD TRADE NEWS DIGEST

Fischler opposes US trade link

Mr Franz Fischler, EU agriculture commissioner, yesterday attacked proposals to create "a rich man's club" by establishing a free trade area between the US and Europe. "I do not favour a grand design at this stage," he said, but indicated that after the EU intergovernmental conference next year, he might favour harmonisation of standards and practices.

During his first visit to the US, Mr Fischler met congressmen and Mr Mickey Kantor, US trade representative, and Mr Dan Glickman, agriculture secretary, to discuss US-EU issues.

On bananas, Mr Fischler said he had never favoured the current regime under which the EU favours its former colonies in the Caribbean. Although "adjustments" can be made, the EU sees no way to redo the programme. Regarding the EU-US dispute over the use of hormones in beef, he said he will convene a conference and ask scientists to give their views.

Nancy Dunne, Washington

Dong Ah wins Libya contract

Dong Ah Construction of South Korea yesterday said it has won a \$5.7m contract to build the third phase of Libya's man-made river project. Dong Ah has become one of South Korea's largest overseas construction companies due to work on the first two phases of the Libyan project which has totalled \$9.1bn in sales. Foreign activity, primarily the Libyan project, accounted for 44 per cent of Dong Ah's turnover of Won2,008bn (\$2.68bn) last year. Dong Ah is South Korea's third largest construction company.

The man-made river project, to be completed in five stages by 2020, is meant to tap Libya's vast underground water table and supply water to the country's main cities and rural agricultural areas. The contract for the third phase, which involves the laying of water pipes and drilling wells by 2007, will be signed in September.

John Burton, Seoul

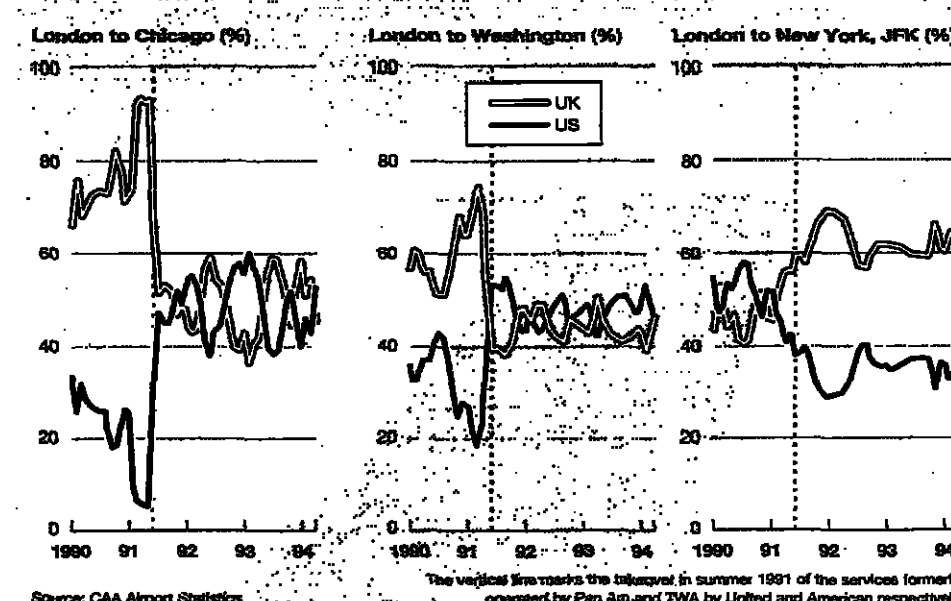
Austrians in oil pipeline deal

Oil Capital, a US petroleum development company, says it has signed letters of intent with a consortium of Austrian industrial suppliers to provide equipment for a proposed \$1.8bn, 930-mile oil pipeline from the Caspian Sea to Turkey. The Austrian consortium, headed by Steyr-Daimler Puch, is expected to rely on Austrian export credits to finance its role in the proposed project. Mr Roger Tamraz, Oil Capital's chief executive, said the financing is based on a minimum commitment of \$500m.

Oil Capital is also negotiating finance for other elements of the project. A Chinese state company is said to be keen to build the pipeline. The proposed pipeline is being promoted as an option for transporting oil from fields being developed by a British Petroleum-led consortium in Azerbaijan to Turkey via Armenia. It is dependent on a peace agreement between Armenia and Azerbaijan.

Robert Corzine, London

Transatlantic market shares



Reaching the limited agreement the two sides announced this week was difficult. Mr Federico Peña, the US transportation secretary, was under pressure from both American Airlines and from Congress to press for an "open skies" agreement of the sort he is negotiating with other European countries, rather than the

limited accord reached. The two countries struck their limited agreement last Friday, but Mr Peña felt unable to go ahead until the UK had made a sufficiently strong commitment to discuss greater liberalisation, including the opening up of Heathrow. By Monday, the US felt it had received this commitment

and the two sides announced their agreement. Talks will take place over the summer, but the US is likely to be disappointed with the UK response. The UK is not expected to agree to any substantial opening of Heathrow. The UK is expected to ask for the Virgin Atlantic flight from

London's Gatwick airport to Boston to be shifted to Heathrow. In return, the US will be offered only one more route into Heathrow. The UK is likely to be prepared to discuss liberalising cargo and charter flights into the airport, but is expected to offer no more access for scheduled passenger traffic.

The UK position is that Heathrow is already bursting. A public inquiry has begun into building a fifth terminal, which will increase the number of passengers handled annually from 52m to 58m.

The increase in passengers will be achieved, however, by packing more of them on to each aircraft. The new terminal will permit no more than a small increase in flights. Heathrow has only two runways and the government has ruled out building any more.

One of the difficulties is that the two sides are demanding markedly different things. The US wants access to the UK's most important airport. The UK wants access to America's less important airports.

One participant in the negotiations says: "The US wants apples and the British demand pears. These are not simple issues. To expect them to be resolved by September is unrealistic."

Editorial Comment, Page 13

US fund set up to boost private sector investment in CIS states

By Jill Davidson in Washington

The Overseas Private Investment Corporation (Opic) of the US yesterday announced the creation of a \$250m fund to boost private sector investment in Ukraine and seven other nations of the former Soviet Union.

The fund will be financed by private investors, with Opic providing a guarantee of up to \$187.5m. More than half the investment will go to Ukraine, Belarus and Moldova with the remainder targeted towards Estonia, Kazakhstan, Latvia, Lithuania and Russia.

Since Opic-supported private

equity funds have the potential to leverage more than nine private dollars for every dollar invested by the fund, the western CIS and Baltic States fund could ultimately bring more than \$2bn of private investment to the region.

This is the second major announcement by Opic in the past two days. On Monday, during the visit of Hungarian Prime Minister Gyula Horn, Opic signed a contract to provide a \$70m loan guarantee for a joint project between US and Hungary to build a telecommunications network in Hungary.

The International Finance

Corporation, the private sector arm of the World Bank, will provide \$35m in loans and \$4m in equity for the joint venture, called the Westel 900 GSM Mobile Telecommunications Company.

Westel 900 is a \$185m project to design, construct and expand a cellular telephone system throughout Hungary which would provide a low-cost alternative to land-line service. "The Westel 900 venture will provide a state-of-the-art cellular telephone service for Hungarians, as well as support jobs in Hungary and promote US exports," said Ms Ruth Barkin, Opic president.

Mr Horn said his government intends to privatise the energy sector, reform social services, make Hungary's currency fully convertible and increase the private sector's contribution to the nation's GDP from 60 per cent to 80 per cent by the end of 1997.

Hungary and Ukraine last week announced they would set up a special economic zone on their common border to boost slumping trade between the former Comecon allies. Businesses would get tax exemptions and border controls would be eased in the zone.

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NEWS: UK

Minister haunted by arms-for-Iraq saga

By Robert Peston and Jimmy Burns

The prime minister, Mr John Major, will enforce the resignation of any minister who is shown by the Scott enquiry to have misled the House of Commons, a Downing Street official said last night.

Mr Major refused, however, to comment on leaks of a draft of the report by Sir Richard Scott, a senior judge, into the conduct of ministers and government officials in relation to sales of arms to Iraq. "I am making no judgments on what may be in the report until the report is complete," he said in the House of Commons. "What we have seen thus far is the malicious leak of a part of the report."

The draft accuses Mr William Waldegrave, now agricul-

ture minister, of having written "untrue" letters to MPs about the government's policy on arms exports to Iraq when he was a foreign affairs minister in the late 1980s.

Mr Waldegrave said he had no intention of resigning. He was given full support by Mr Major. In private briefings to Tory MPs, Mr Waldegrave denied he had made misleading statements about the sale of arms to Iraq. The nub of the allegations against him is that the government had relaxed its embargo on the arms sales, but that he had consistently denied that there had been a change of policy.

"Neither I nor anyone else working with or for me took the view in 1988 and 1989 that there had been a change of policy which should have been announced to Parliament," he told MPs. "There is no conceivable reason why I should wish to have taken the absurd risk of consciously misleading par-

liament for no personal or political gain."

Mr Waldegrave is angry that Sir Richard did not help him to seek an injunction against the BBC preventing it from broadcasting the extracts from the leaked report on Monday night.

At 4pm on Monday, his lawyer alerted the Scott inquiry team that the BBC had the leaked document. At 8pm, one hour before the BBC's main evening news broadcast, Mr Christopher Muttukumaru, secretary of the Scott inquiry, faxed a letter to Mr Tony Hall, head of BBC news and current affairs, requesting that the leak be not reported "in fairness to the individuals" involved.

Mr Major said that despite the leak he had "confidence in Sir Richard" and would not report the leak. Sir Richard is concerned, however, that there is a whispering campaign against him in parliament and in the government machine, and fears that leaks of his draft



Roseanna Cunningham (second left), Scottish National party victor in a by-election caused by the death of a Conservative MP, took her seat in the Commons yesterday. Celebrating with her were the party's three other MPs: (from left) party leader Alex Salmond, Margaret Ewing and Andrew Welsh.

report will serve only to undermine the effectiveness and credibility of his final version, according to his officials.

Lord Trevelyan, former trade and defence minister, said yesterday: "It is clear to me that the draft extracts which have been made public do not give

adequate or fair regard to the considerable body of evidence which has been put before the inquiry."

The Foreign Office said last night it was investigating allegations that the leak of the draft extract may have come from its offices. Related proce-

dures for the circulation of copies of Scott documents within Whitehall mean that the draft extract criticising Mr Waldegrave had been by several officials. Sir Richard was adamant that no one in his inquiry team had been responsible for the leak.

More than 4m municipal homes may be privatised

By Our Political Editor

The government is considering privatising entire municipal housing estates and tower blocks as part of a sweeping programme to improve the quality of low rent housing and increase the availability of cheap private sector accommodation.

A housing paper which should be published in the next two months is expected by officials and ministers to contain

proposals for new "local housing companies" to buy dilapidated council housing. The companies would be financed entirely by the private sector, unlike existing housing associations.

The initiative is regarded in government as being potentially as important as the right-to-buy policy of the early 1980s, which gave council tenants the right to purchase their houses and flats at a discount. Up to 4.5m council-owned homes

could be available for transfer under the scheme. Dilapidated estates would be sold to the new companies at a comparatively low price, on condition they invested in renovating and refurbishing the properties.

The properties could not be transferred without the consent of their tenants. However, these tenants would be given guarantees that their rents would not rise sharply for a specified period - probably five

years - and would have a say in running the companies. Tenants might also be given a stake in the companies, so they could benefit from any increase in value.

Mr John Major, the prime minister, is intent on making the provision of low cost housing one of his cornerstone policies in the run-up to the general election. Other proposals being considered are aimed at reducing the cost of land for builders of cheap housing for

first-time buyers. About 25 per cent of the cost of new housing reflects the price of land. The government may give a subsidy to housebuilders for land purchase, so long as this saving was reflected in the selling price of the houses.

Also under consideration is an increase in land reclamation programmes, with the reclaimed land being allocated for cheap housing.

In an attempt to widen private ownership, Downing

Street would like to give tenants of housing associations the right to buy their properties.

But this is being blocked by the Department of Environment which fears that private-sector lenders to housing associations would be alarmed at the implicit fall in the value of properties if tenants were able to buy their homes at a discount. The government is therefore considering paying for the discounts.

Advisers 'failed to restrain publisher'

By John Mason, Law Courts Correspondent

Lawyers and accountants who advised the Maxwell empire failed to object to Robert Maxwell's practice of running his companies' pension schemes as well as the companies themselves, a London jury heard yesterday.

Mr Trevor Cook, the former head administrator of the Maxwell pension funds, said nobody argued with the former publisher taking control of investment decisions for the

pension funds. He was asked by a lawyer for Mr Kevin Maxwell whether any professional adviser or director had thought it wrong that Robert Maxwell should have such a dominant role over both his companies and the pension funds. Mr Cook, a prosecution witness, said: "There was concern and awareness of the position, but so long as his decisions benefited the pension schemes, I don't think anyone would argue against the transactions."

Mr Kevin Maxwell, a son of Robert Maxwell, is one of four men charged with conspiring to defraud the pension funds to prop up indebted Maxwell com-

panies. The other defendants are Mr Ian Maxwell (another son of Robert Maxwell), Mr Larry Trachtenberg and Mr Robert Bunn, all former Maxwell company directors. All four deny the charges.

Mr Cook, a former director and compliance officer of Bishopsgate Investment Management (BIM), the pension fund managers, was questioned about a number of transactions in which shares were transferred between Maxwell companies and the pension funds.

He was asked by Mr Kevin Maxwell's lawyer: "Was the position being accepted that Robert Maxwell was using pension funds as a source of liquid

finance and as a vehicle for parking shares or selling them back if he needed the cash?" Mr Cook said the practice was for Robert Maxwell to give the pension funds first refusal for shares he was selling.

But Robert Maxwell was on "the other side", the pension funds, being offered the shares, the lawyer pointed out. Mr Cook agreed, saying it became established for the trustees to allow Robert Maxwell to operate as investment manager for the pension funds.

He agreed, however, that two accountancy firms, Cooper & Lybrand and KPMG Peat Marwick, had criticised the way BIM was run.

State aid to film industry may reach \$125m

By Raymond Snoddy in London

The British film industry was yesterday offered the prospect of more than £280m (\$125.6m) in new financial support over the next five years using funds raised by the National Lottery. The estimated amount would represent the biggest injection of state funds into the film industry for 10 years.

The money - made up of £70m to invest in film projects and a further £10m to increase the number of prints of British films in the market - would come from the Arts Council of England, one of the beneficiaries of lottery funds.

Mr Stephen Dorrell, the national heritage secretary, made the first government policy statement for the industry since 1984 and admitted that his own attitude to the film industry had changed since he had "learned more about it".

In 10 years the British cinema audience, he said, had more than doubled to 124m admissions last year. More films were made in Britain last year than in any year since the 1970s.

Mr Dorrell also said the Treasury would "carefully consider" the case for changing the tax regime faced by the film industry "together with the logic which underpins it".

Mr Chris Smith, the opposition Labour party's national heritage spokesman, quoted Humphrey Bogart in *Casablanca* and said the govern-

ment's proposals "didn't amount to a hill of beans".

Mr Michael Grade, chief executive of the Channel 4 television network, described the proposals as "a disappointment but not totally negative". He denounced as "half-baked" an idea that the BBC should run a showcase cinema in London's West End devoted to launching British films. "The BBC can't even run their own finances, never mind a cinema," Mr Grade said.

Earlier Mr Dorrell explained that the lottery money would be invested in the way pioneered by British Screen, which has invested £37m in 1,002 feature films since 1986 with government support. Money from successful films would be recycled in future productions.

Mr Peter Gummer of the Arts Council for England emphasised that each application would be judged individually but that Channel 4, commercial television companies and commercial film makers such as Polygram, producer of the hit movie *Four Weddings and a Funeral*, could apply for funds.

The Arts Council has received 89 film-related applications for a total of £12.1m.

Mr Dorrell pledged support for the creation of a London Film Commission, promised to establish an advisory committee to examine the financing of independent film production, and promised to provide £180,000 to support Cinema 100, an organisation marking the centenary of the cinema.

Camelot results, Page 21

UK NEWS DIGEST

HSBC chief attacks standards in education

A senior international banker yesterday attacked British complacency over the education of its workforce. Mr John Bond, chief executive of HSBC Holdings, which owns Midland Bank and Hongkong and Shanghai Bank, said a British bank clerk's qualifications would not gain him or her a job in Hong Kong. In Hong Kong his company's bank would not traditionally consider putting a member of staff on the counter serving customers who did not have 2 A-levels, the school exam used in Britain as a qualification for university entrance. In Britain, Midland's educational requirements for a similar job were four GCSEs, a less specialised exam taken two years before A-levels.

The comparison between the Midland and Hongkong banks in their recruitment policies demonstrated "worrying shortcomings," Mr Bond said. "We live in an era of unprecedented change and we need to match the dedication, enthusiasm and resources given to education by our Asian competitors if we are to keep ahead," he said. Countries such as Malaysia and Hong Kong demonstrated a "missionary zeal for education, just as Britain had more than a century ago."

Lisa Wood, Employment Staff

Change nears for Crown Agents

A bill which comes close to privatising the Crown Agents, the UK's overseas procurement organisation, last night crossed a significant hurdle in its passage through the House of Commons. The bill will transfer the Crown Agents to an independent foundation, with trustees appointed by the government. Ministers will retain a veto over its affairs for five years.

The opposition Labour party claims the foundation is the first step to full privatisation. Mr Tony Blair, a junior foreign affairs minister, said the organisation was a "great British success story" providing procurement, management and technical services to 130 countries. But it was "no longer necessary or appropriate for the Crown Agents to remain in the public sector with all the constraints on their work that involves."

George Parker, Westminster

Miners vote for strikes

Miners employed by RJB Mining, owner of most former state coal mines in England, are to stage one-day strikes from next Tuesday with further stoppages every Friday and Monday in protest at a planned freeze in basic wages. The executive of the National Union of Mineworkers agreed unanimously to call the strikes after 83.4 per cent of members voted for industrial action in a secret postal ballot.

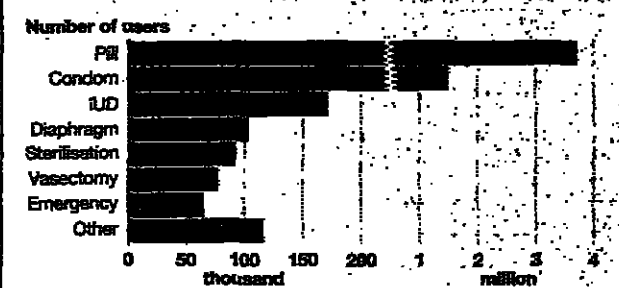
Robert Taylor, Employment Editor

Pill outsells condoms

Six million people in the UK regularly use contraceptives, says the Family Planning Association. Oral contraception - the pill - is much the most popular method, with 3.8m users, followed by condoms with 1.5m. Research by the association on the economics of family planning shows that contraception prevents 3.8m unwanted pregnancies a year. Of these, 3m would have led to live births, and the remainder would have ended in abortion or miscarriage.

As a result, the association estimates, the state health service saves £2.6bn (\$4.1bn) a year - £2.1bn on the cost of births, £400m on abortions and £100m on miscarriages. The NHS spends only £160m a year on family planning. Mr Jon Wareing,

Contraceptive preferences



Source: Family Planning Association

chairman of the Contraceptive Alliance which sponsored the research, said: "This report proves that family planning services are highly cost-effective and that unwanted pregnancies are very expensive for health and social services."

Clive Cookson, Science Editor

Vacant offices decline

The amount of office space available for sale or letting next to London's orbital motorway has fallen to the lowest level for at least five years, say estate agents Knight Frank & Rutley. A shortage of new buildings could spark a moderate increase in development which has largely halted along the motorway since the recession, say the agents. The vacancy rate, which has fallen to 9.1 per cent compared with 14.4 per cent two years ago, is the lowest since the survey began in 1990. Only 219,500 sq m of new accommodation is available compared with an annual take-up last year of almost 250,000 sq m.

Andrew Taylor, Construction Correspondent

Postmen bite back: Attacks by dogs on postmen delivering letters rose last year by 600 to a total of 6,000, said the Union of Communication Workers. Postmen in some English cities are being equipped with cans of spray to ward off dogs. The union said dog bites should be declared an industrial disease so that bitten workers would qualify for state compensation.

Crash investigation: Police are investigating a crash in eastern England in which a £30,000 Jaguar car ended upside down in a field by the road. It was being test-driven by a policeman to see if it was suitable for the local force to use as an armed response vehicle.

Trade plea coincides with drop in sales of new vehicles to private buyers

Aid sought for scrapping old cars

By John Griffiths in London

Car dealers and manufacturers yesterday called on the government to follow France, Spain and other European Union states in offering financial help to motorists to encourage the scrapping of old and environmentally "dirty" vehicles.

The Society of Motor Manufacturers and Traders said the number of cars over 10 years old and still in use had risen to 7m - nearly a third of all cars - from 5.5m in 1989.

The society based its argument on environmental grounds, but another incentive could be found in statistics it released yesterday showing only a slight year-on-year increase in new car registrations during May and a further collapse of sales to private motorists.

Total registrations last month at 162,688, were 1.78 per

J.C. Bamford Excavators, the largest European manufacturer of construction equipment, yesterday warned of a softening of the UK engineering market. Mr John Patterson, managing director of JCB Sales and Service, said he expects growth in his company's production volume this year to slow markedly from 1994 levels to an increase of

cent higher than the previous May's 150,070. But the increase was only the second monthly one this year and left total registrations for the first five months down 0.57 per cent to 816,972 from 821,515.

The gloomiest aspect of the May statistics was a year-on-year fall of 7.7 per cent in registrations to private motorists and stagnant registrations in the non-fleet business car sector. In unit sales, these were

between 8 and 12 per cent. He said there were doubts about the performance of the UK economy in the second half of this year. Last year, a surge in demand lifted JCB production by 56 per cent to 18,045 machines. The company expects difficulties in the UK and US to be offset by higher sales in east Asia and mainland Europe.

offset by an 11 per cent rise in fleet car registrations. But almost all fleet sales are cut-price, and carmakers and dealers look to the private and non-fleet business markets for sales profitability.

For the first five months of this year private registrations were 8 per cent lower, reducing their share of the total market from 48 per cent to 44 per cent. Non-fleet business registrations were down 1.3 per cent

for an unchanged 7 per cent market share. Fleet registrations were up 7.4 per cent, accounting for 49 per cent of the market compared with 45 per cent in the same period last year.

Mr Ernie Thompson, society chief executive, said last month's small total registrations rise was welcome, but it reflected "the continuing serious decline in private sales".

A consequence was an ageing car population, he said, which was "very bad news for the environment... new cars emit only a fraction of the pollutants of older vehicles and are far more fuel efficient".

The French incentives are considered to have helped the rebound of the car market last year, when sales rose by nearly 15 per cent. Car owners who traded in models more than 10 years old to buy a new car received FFrs5,000.



If the rainforests are being destroyed at the rate of thousands of trees a minute, how can planting just a handful of seedlings make a difference?

A WWF - World Wide Fund For Nature tree nursery addresses some of the problems facing people that can force them to chop down trees.

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This is particularly valuable in the Impenetrable Forest, Uganda, where indigenous hardwoods take two hundred years to mature. The Markhamia trees planted by WWF and local villages can be harvested within five or six years of planting.

Where trees are chopped down to be used for construction, as in Panama and Pakistan, we supply other species that are fast-growing and easily replaced.

These tree nurseries are just part of the work we do with the people of the tropical forests.

WWF sponsors students from developing countries on an agroforestry course at UPAZ University in Costa Rica, where WWF provides technical advice on growing vegetable and grain crops.

Unless help is given, the soil is exhausted very quickly by slash and burn farming methods. New tracts of tropical forest would then have to be cleared every two or three years.

This unnecessary destruction can be prevented by combining modern techniques with traditional practices so that the same plot of land can be used to produce crops over and over again.

In La Planada, Colombia, our experimental farm demonstrates how these techniques can be used to grow a family's food on a small four hectare plot. (Instead of clearing the usual ten hectares of forest.)

WWF fieldworkers are now involved in over 100 tropical forest projects in 45 countries around the world.

The idea behind all of this work is that the use of natural resources should be sustainable.

WWF is calling for the rate of deforestation in the tropics to be halved by 1995, and for there to be no net deforestation by the end of the century.

Write to the Membership Officer at the address below to find out how you can help us ensure that this generation does not continue to steal nature's capital from the next. It could be with a donation, or, appropriately enough, a legacy.

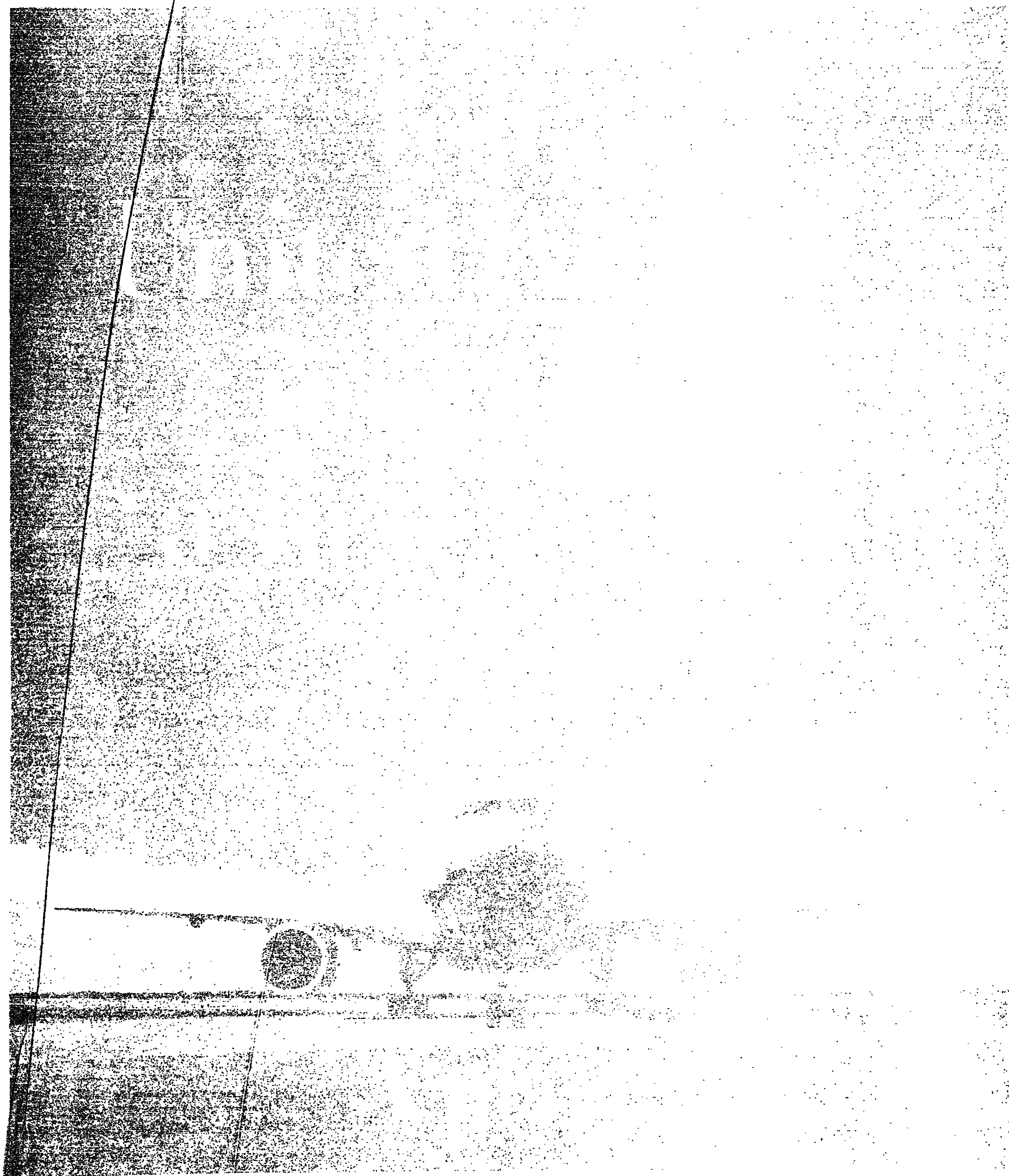


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BUSINESS AND THE ENVIRONMENT

Taking the environmentally damaging phosphates out of washing powders leads to more damage than if they are left in, claims Landbank, the UK environmental consultancy.

The statement is a brave one, considering the environmental case against phosphates.

Large-scale use has made phosphates a pollutant. They turn ordinary water into rich breeding grounds for algae blooms which take so much oxygen that all around them dies.

Phosphates, which make detergents' other ingredients more effective, were introduced into soap powders in the late 1940s by Procter & Gamble and soon accounted for around a quarter of most washing powders.

The main cleaning agents in washing powders are surfactants, which attract soil and fats away from fabrics into the water. But surfactants work less well in hard water. Phosphates both soften water and hold the dirt in suspension, preventing it from reattaching to the laundry.

In the European Union alone, consumers use 4m tonnes of washing powder a year, which is then emptied into their drains. Usually, the phosphates are not removed during waste-water treatment.

Many countries have moved to control the use of phosphates in detergents or ban them altogether. The first ban came into force in 1972, in the Great Lakes region of the US and Canada. Other US states have followed, and a federal ban is being considered. In Europe, Norway and Switzerland have imposed bans. Austria, Germany and Italy have introduced mandatory controls, and there are voluntary restrictions in Belgium, France, the Netherlands and Finland. The UK has no restrictions, but regulations elsewhere mean that few washing powders now contain phosphates.

Landbank argues that there is a better solution to the phosphate problem than banning them. In two life-cycle analyses, Landbank has conjured up a vision that would lead to a reduction in mining, transport, industrial effluent, and pollution, not to mention better washing powders - by using phosphates.

Manufacturers have turned increasingly to a mix of two ingredients to do the job of phosphates: zeolites, made from bauxite, the aluminium ore, and polycarboxylates, or PCAs, which are petrochemicals. In its first analysis, published last year, Landbank concluded that the mining, production and transport of these alternatives were more damaging environmentally than the equivalent processes for phosphates.

Although the study was funded by the world's leading phosphates producer, Albright & Wilson, Land-

Model of environmental damage

	Current	Phosphates only	Zeolite/PCA only
Sweden	78	55	80
Norway	87	59	87
Finland	117	82	113
Denmark	327	183	570
UK	536	164	848

1000 = worst case scenario

Source: Landbank



Jenny Luesby on the case made for reinstating phosphates to detergents

Lather over laundry

bank's environmental credentials include the fact that it is led by Bryn Jones, a former director of Greenpeace.

Landbank used a panel of anonymous scientists to decide what pollution to include, how to measure it, and how to compare, quantitatively, the environmental damage caused by dissimilar pollutants.

The most interesting points raised by the report did not relate directly to the life-cycle model, but to two subsidiary issues.

The first concerned the relative performance of zeolite/PCA. When water hardness increases, more zeolite/PCA is needed to give a wash equivalent to that given by a fixed level of phosphates. Thus, many consumers use more phosphate-free detergent to produce the same effect, pouring extra bleach, enzymes, brighteners, perfumes and

dyes down their drains in the process.

The second point was that phosphates can be stripped out of effluent using water-treatment techniques standard in Scandinavia, whereas zeolite/PCA cannot.

Landbank's second analysis, just published, investigates the implications of these two points, by comparing pollution levels, with and without a detergent ban, in the Nordic countries where phosphate is widely removed from sewage, and the UK where it is not.

Its findings are stark, although they suffer from the limitations inevitable in hypothetical models.

Landbank has drawn on an even wider panel of scientists, monitored by an independent scientific auditor, to agree the assumptions used in the model. But this has not made the results factual - a typical exam-

ple is the pollution points attached by the panel to zeolite/PCA: it is not known that they pollute, but it is also not known that they do not pollute. So they are scored, in the final indices, as if they do pollute, as they represent a potential risk.

Landbank has run sensitivity analyses to see how different the indices become if each individual assumption, and the pollution points that go with it, is changed. The results suggest that the pollution gains from phosphate detergents do not depend on any one, possibly weak, link in the model.

The report's main conclusion, that better waste-water treatment is the most environmentally effective way of dealing with phosphates, sits interestingly, again, with the choice of sponsor. The report is funded by Kemira of Finland, a leading supplier of water treatment systems.

Nonetheless, the report offers a detailed analysis of the logic of banning phosphates, and the possible gains from alternative measures.

Phosphates are also used in food additives, animal feeds and industrial wastes. They are one of the main ingredients in fertilisers, and comprise a substantial component of human waste. Of all these, only detergents were an easily addressed target, and their scale was significant - detergents still account for some 6 per cent of new phosphates entering the UK. But banning them could never be a solution on its own.

When the Great Lakes authorities first proposed the detergent ban, they also recommended more intensive sewage treatment, and measures to prevent fertilisers draining into rivers and lakes. It has been these changes that achieved most in curbing phosphate levels in the Lakes, the Landbank report argues.

And once phosphates are removed from sewage, there are other considerable environmental benefits, it says. For instance, the processes that remove phosphates also capture many of the heavy metals that make sewage sludge unsuitable for use on agricultural land.

Where the phosphates extracted are formed into pellets, these can be suitable as a raw material, which would cut the need for mining.

"No one says phosphates are not bad," says John Driver, manager of regulatory and environmental affairs at Albright & Wilson. "But they are more easily removed than the alternatives, and they are recyclable in a way which makes fully recyclable sewage possible."

Landbank's vision is neither obvious nor simple. Rehabilitating phosphates in washing powder will be a tough act. But persuading water authorities of the benefits of a capital investment programme to achieve recyclability is likely to be tougher still - even if it were, ultimately, self-financing.

Sheep farmers' unlucky dip

Organophosphates producers are under pressure over allegations of danger to users, writes James Harding

Sheep farmers face a tough dilemma: a choice between their welfare and that of their flock. Organophosphate dips help protect sheep from scab, blow fly and other lethal diseases. But they could also be endangering farmers' health.

With mounting scientific evidence linking organophosphate dips with human illnesses, ranging from nervous disorders and suicidal depression to paralysis, pressure for a ban on organophosphates is growing. Agrochemical manufacturers are being urged to either defend their industry, for fear that any UK ruling could have global repercussions, or to offer farmers inexpensive and effective alternatives.

Although a long way from proposing an outright ban, the UK government has taken an increasingly stern view of organophosphates in recent years. In May, a study sponsored by the Health and Safety Executive concluded that "exposure to organophosphate-based pesticides appears to be associated with subtle changes in the nervous system".

Even this tentative criticism of organophosphates marks a substantial shift from previous government opinion, which denied any unacceptable health risk from OP exposure. In the next two weeks, the government is inviting applications for further research. If scientists confirm anecdotal evidence submitted to the British Medical Association, the government attitude to organophosphate dips may harden further.

Dr Richard Bernhardt, a general practitioner from Kent, cites a previously healthy young farmer who after exposure to organophosphate dips suffered increasingly debilitating inflammation of the heart until his fourth exposure to the chemical prompted a collapse from nausea and a cardiac arrest.

Dr D R Davis, a consultant psychiatrist in Taunton, describes the levels of anxiety among farmers and high incidence of bulimia nervosa in young farming

men, and concludes that "the arguments are so strong that psychiatric disorders may be caused by OP [organophosphate] exposure, that the government should be considering a moratorium on their use".

Representatives of the organophosphates industry respond that they will "fight to the bitter end on any ban". That may seem excessive vehemence in defence of revenues for organophosphate dips in the UK worth less than £7m last year, but the industry's fear is that any ban on sheep dips could have damaging repercussions for organophosphates used as pesticides throughout agriculture.

Sales of organophosphate crop protection products in the UK last year totalled £48m, according to the British Agrochemicals

Association, and estimates of the industry's global turnover run into several billion dollars. Industry vets dismiss research suggesting a health risk as "hearsay, anecdote and poor science".

Agrochemical producers argue that public anxiety - fed by allegations that exceptionally high suicide rates among farmers and even Gulf War Syndrome among UK servicemen can be linked to OPs and that sprayed crops could be poisonous - results from misunderstanding.

Richard Trow-Smith, spokesman at the BAA, explains: "Organophosphates are a large group of compounds and you would not ban mushrooms because a few toadstools are lethal. Toxicity in OPs is similar to that in the fungus family."

The National Office of Animal Health (Noah), which represents producers of animal medicines, claims that statistically the problem is negligible. Between

1985 and 1992, there were 247 reports, many improved, of problems involving OP dips, in which period Noah estimates there were more than 3m contacts between humans and sheep dips.

Where there have been reports of illness after organophosphate use, agrochemical producers say most of them have been traced to farmers mishandling the pesticides. "All the information that you need is on the label. If you are reading the label and doing the job properly then there should be no problem at all," says one animal health officer at an international agrochemicals company.

The industry says it is already developing non-contact applications to assess concerns. For the sheep dipper this means pour-on biotry and scab treatment. For crop sprayers, organophosphate producers offer "closed systems" to transfer OPs into sprayer tanks.

Agrochemical producers at the moment believe that if the government acts at all it may opt for a policy that puts the burden of responsibility on the users.

With requirements that OPs are only handled by trained and certificated users in assessed protective clothing, "the government will have put out exposure to the problem," one industry official forecasts.

Manufacturers say they can offer alternatives to organophosphates for both crop and livestock protection, but at a higher cost. The problem, says Phil Dobson, animal health officer at Ciba Agrochemicals, which produces organophosphate sheep dips as well as more expensive alternatives, is that "even though there is an alternative [treatment] for each of the diseases, if you banned OPs you could not get a product that offers the same efficacies across the board. Nor one that is so cheap."

Ultimately, OP producers suggest, that is the farmers' real dilemma: not between human and animal welfare, but between a cheap and powerful pesticide or more expensive alternatives and peace of mind.

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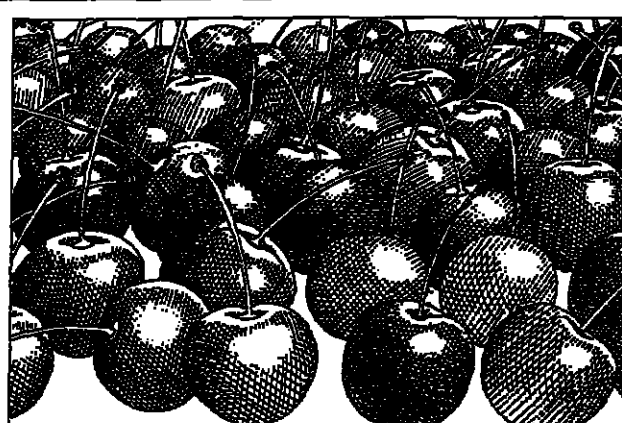
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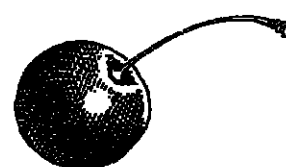
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Television/Christopher Dunkley

Documentaries with attitude on history

Very few programme types are pure television. The various sorts of drama have mostly been taken from theatre and cinema, news programmes have borrowed from newspapers and cinema newsreels, and even the pop video which looks like television *sui generis* actually originated as a film loop produced for juke boxes.

However, one form that television really can call its own is the history documentary with attitude – a pretty odd and specialised sort of programme, perhaps, but one which becomes increasingly common. Among those running at the moment are two series on BBC2: *Strange Landscape* which is trying to make sense of the middle ages, and *The Living Dead* which says it is about “the attempts of those in power to control the past”. The same network brought us *Progress Through Politics* on Sunday, in which John Cole combined autobiography with an outline of British politics during his years in newspapers and television.

The important difference between these programmes and any old history or documentary programme is that these are not just informational or observational but are inspired by some sort of thesis. And the vital requirement if you are to succeed is that there should be just one editorial voice and it should be quite clear about what it wants to say.

Of the three productions reviewed here, John Cole's adhered most closely to that rule and the result was a programme which was clear and enjoyable even if it hardly knocked you sideways with its revelations or the novelty of its insights. We are entirely accustomed to a mixture of autobiography and opinion in book form, but the combination is less common on television where there are worries about “balance”, especially in the case of politics.

Cole seems to have got away with it because, first, he is not a politician, second, he was for some years the BBC's political editor thus proving his trustworthiness, and third, and above all, because his own political beliefs happen to lie somewhere in that broad central area covering one-nation Tories, the SDP and almost the entire Labour party except for its extreme left wing. He is a “Buckley” just like so many in the BBC, and as he made clear in this programme, greatly disliked Thatcherism. Would he have been allowed to make it if he had been a supporter of the Militant Tendency or the National Front? In those circumstances he

would never have been recruited by the BBC in the first place, so the question would not have arisen. Remember, there used to be a government intelligence man in Broadcasting House who put a Christmas tree sticker on your personnel file if you were not considered pukka.

Much the same “one of us” test was used by the medieval church in rooting out dissidents such as the Albigensians, as Christopher Frayling explained in the second episode of *Strange Landscape*. There were hints at the start of this series that it would be indulging in the same sort of electronic party tricks which have ruined other recent history series, but there has actually been tolerably little.

It has succeeded in conveying a strong sense of how it may have felt to live in, say, the 12th century, which is no mean trick. What has somewhat spoiled it is a subtle mis-match between the work of the presenter/script writer and the work of the film makers. It looks as though Frayling (or someone) wrote an outline, the film makers and researchers then went off and found all sorts of medieval churches, castles and pictures, working up a whole lot of dramatised sequences for good measure, and Frayling then tried to “write to picture”. If this (a common enough approach) is not what happened, and the entire undertaking really was organised to serve Frayling's thesis, then someone has a lot of explaining to do.

For instance, what purpose was served in this week's programme by the long impressionistic sequence about the Inquisition? Frayling described the organisation nicely as a cross between a detective agency and a court of law, but the film sequence – set in a Robin Hood castle, shot into the light, full of smoke or steam, with a lot of muttering about women listening to heretics – hinted without stating. It is hard to believe that Frayling asked for the sequence, not least because he remained silent throughout. And what was supposed to be the connection between the brutal suppression of the Albigensians and the rise of Francis of Assisi? You could see that Frayling might want to cover both subjects, but why simultaneity? We were subjected repeatedly to “Meanwhile back at the ranch” sequences. It feels very much as though there is more than one author at work here.

On the other hand Adam Curtis is clearly the onlie begetter of *The Living Dead*, being writer, producer



A 'medieval' montage illustrating Christopher Frayling's series 'Strange Landscape'

and director. Yet, judging from the first of his three episodes, either he is confused about what he wants to convey or he has failed to find a way of conveying it clearly. This programme seemed to be saying (a) that the Nuremberg trials did not investigate the causes of Nazism, but who thought they could or should or even might? Then (b) it implied, as though this were a blinding revelation, that all of us have within us some trace of that inhumanity which characterised Nazism; that far from being inhuman anomalies the Nazis were much like other people. Considering the slaughter and torture under Stalin and Pol Pot, not to

mention the medieval church, that hardly astonishes. Anyway, it has all been said many times before. So why blame the Nuremberg trials for failing to investigate the origins of such behaviour?

The programme introduced us to former American soldiers who felt that the “We’re good, they’re bad” attitudes of Nuremberg were too simple. But, once again, that just is not news. To find yourself using more evil than you had intended in order to conquer evil has been a common experience down the ages. The most interesting aspect of this opening programme was the account of Goering's willingness at the trial to

argue a pragmatic case for Nazi policies in pre-war Germany, though this did not seem to form a central part of Curtis's thesis. Furthermore even this side issue was confused by details about nail varnish, parties organised by the American bureaucracy, and a bafflingly irrelevant account of one bureaucrat hoping to date a woman named Nancy but discovering her brother worked in the same office.

Documentaries with attitude can enable television to move closer to the free speech traditions of the older mass media. But as ever structure, and especially the dictatorship of the picture, can be problematical.

Recital/David Murray

The Haefliger, père et fils

For Bach and Mozart lovers of a certain age (not all that old), Ernst Haefliger's name stands for an admired style: cool and selfless, but scrupulously expressive of line, so perfectly practised as to sound natural and easy. This Swiss tenor has been an ornament to innumerable performances and recordings of Bach's Passions and cantatas, and the earlier Mozart in particular. In recent years he has continued to sing, but mostly to teach. He turns 76 next month, and has at last decided to retire from the platform; the Schubert *Winterreise* he sang at the Wigmore Hall on Friday was a farewell.

As it happens, Haefliger's pianist-son Andreas has risen to great acclaim these last two or three years, in all the musical capitals. It must have been a great satisfaction to Haefliger père that he could have him to accompany this *Winterreise* not just as a filial tag-along, but as a serious partner. The son did him some agonising peaks – struck home as clearly as in bigger readings by expansive younger voices.

We have heard *Winterreise* rendered with greater outpourings of passion, but not with more plain, bleak, unshowy insight than this. Strictly Classical in style, hardly at all Romantic, but direct and scathing, it was a model lesson from an undimmed master (not to forget his son). All in all, in fact, and one felt somehow privileged to have been there.

schmeichele tone is just a cosmetic nuisance in real music. What was truly astonishing was his complete musical control of his ancient instrument.

We heard at once what kind of voice it is now – but also, and throughout, its undiminished ability to shape every phrase to Haefliger's mature purpose, its phenomenally true pitch, its capacity for (relatively) loud despairing outcries as well as telling *sotto voce* asides. Many recitals by artists who have gone on too long leave macabre impressions: they make us recall their palmer days, now cruelly self-caricatured or patchily reproduced. Haefliger, even at his improbable age, needed no allowances made.

He fixed the dimensions within which he would operate very early on, measuring the highs and lows on a canny scale that soon imposed itself as a norm. Accordingly, a little tone went a long way again and again: the sharpest outbursts – *Winterreise* has some agonising peaks – struck home as clearly as in bigger readings by expansive younger voices.

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Jazz/Garry Booth

Sonny Rollins

There is something about Sonny Rollins' exuberant dismembering and reassembly of a tin pan alley tune that encapsulates all that has happened in jazz music since the war. This protean improviser can take a faded beauty such as “Cabin In The Sky”, gather up the blues, bebop, post-bop and the squeaky stuff of the 1970s, and make all the connections to give the tune new life. Then, when you think he has shown you everything, the saxophone colossus reminds you of his real roots by sliding into a calypso.

Rollins is one of the most important figures in post-war jazz. Sixty-five years old this year, he began on tenor in 1947. By the early 1950s he had fully developed a robust style which combined the blue drive of Dexter Gordon with the melodious invention of Lester Young. In the mid-1950s he added the entirely disparate influences of Miles Davis's rarefied tempo settings and Thelonious Monk's off-kilter swinging through work with both. All this came together with Clifford Brown and Max Roach in the hard bop band to end them all. Study sabbaticals and adventures into the avant garde followed until the 1970s and the formation of a quintet vehicle for his improvisation.

Since then, Rollins' performances have remained a no holds barred exhibition of the leader's extraordinary physical and musical prowess, where accompanists exist to anchor his soaring improvisation. So it was at the Barbican Hall on Saturday, with Rollins in the middle of a European tour. But it would be unkind to say that this sextet of piano, bass, trombone, drums and percussion is boring. Rollins likes a rock-steady ground support crew and that is the way this band is.

“You” had Rollins in characteristic horn-pointed-to-the-heavens mode filling the hall with a blizzard of ideas and notes. Rodgers and Hart's “Falling In Love” was blown inside out to a background of golden harmonies from Clifford Anderson's trombone. Bird's “This Is Always” was initially tackled straight until bitter sweet tones gave way to a probing examination of every corner of the tune.

“Don't Stop The Carnival”, a calypso comfortable as an old shoe, was run ragged, Rollins whimpering, squealing and ultimately baying to the bridge. A standing ovation ensued and Rollins, with characteristic wit and timing, played us out with “Foggy Day” in London Town. There are no big surprises left in the man, but he continues to be reassuringly astonishing.

Theatre/Sarah Hemming

Borchert's 'Out in the Cold'

er's own experiences. A budding writer and performer, he was posted twice to the Eastern Front, where his health was ruined. He died, aged 26, in November, 1947, just one day before his play had its stage premiere. The experience also cost him his peace of mind: the play, which operates on many levels, could be read as a tour around a mind struggling with horrific post-traumatic stress.

Our soldier, Corporal Beckmann, haunted by the futile carnage he has witnessed and tortured by the discovery of his wife's infidelity, decides to end it all by jumping into the Elbe. The river, however, kicks him back out and, accompanied by his optimistic alter-ego, the ruined little man begins a bizarre odyssey around the civilian world that will bring home to him how unwanted he is.

The play, composed as a series of short, surreal episodes, has the structure of a parable, tips in and out of naturalism like a Potter screen-play and is laced with withering irony and black, black comedy. It could be a nightmare, or the weird last visions of the drowning soldier – what-

ever, it was clearly written fast by a young, feverish and furious mind. It is crude, didactic and distinctly patchy, but it burns with ambition and energy and what comes howling out of it is the anguished cry “Why?”

It is good to see the fine Greenwich Studio company, who have won awards for their crystalline productions of rare classics, taking on this difficult option. The production, directed by Margaret and Julian Forsyth, accentuates the play's strongest aspects by setting it in a cabaret context. This helps to support its

switchback style and macabre comedy and to contain its array of thinly-sketched allegorical and grotesque characters.

Eddie Marsan gives an arresting performance as Corporal Beckmann, making him a pathetically comic figure, with his shaven head and worn greatcoat and his regulation gasmask spectacles clamped to his head like fish-eyes.

For the most part, the company carries the play successfully, though there are a few rough patches where it does not overcome the immaturity of the work and where perfor-

mances either go over the top or seem uncertain (exchanges between Beckmann and the Optimist remain stilted, for example). But it does release the immediacy and urgency that fuel it. Who will forget Margolyes, Serene Evans and Josephine Tawson; 8pm; *Donmar Warehouse* Tel: (0171) 369 1732

● *Insignificance*: written and directed by Terry Johnson. Cast includes Frances Barber, Alan Armstrong, Jack Klaff and Ian Hogg; 8pm; from Jun 7 (not Sun) *National, Cottesloe* Tel: (0171) 928 2252

● *Richard II*: by Shakespeare. Deborah Warner's new production featuring Fiona Shaw as the King; 7.15pm; Jun 12, 13 *National, Olivier* Tel: (0171) 928 2252

● *Under Milk Wood*: by Dylan Thomas. Directed by Roger Michell and stars Robert Ilythe; 7.15pm; Jun 12, 13 (2pm) ● *Women of Troy*: by Euripides, translated by Kenneth McLeish and directed by Annie Castledine; 7.15pm; Jun 9, 10 (2pm)

● *Los Angeles* GALLERIES

County Museum Tel: (213) 857 6000 ● Kandinsky: Compositions: six of the seven surviving “Composition” paintings are presented along with 25 preliminary studies which trace the artist's evolution; to Sep 3

● *Munich* GALLERIES

Haus der Kunst ● *The Splendour of The Farnese*: exhibition that brings together art collected by the Farnese dynasty in the Italian Renaissance with statues, medals, coins and more than 130 paintings by the likes of Parmigianino, Brueghel, Sebastian del Piombo and Titian; to Aug 27

● *Paris* CONCERTS

Châtelet Tel: (1) 40 28 28 40 ● New York Philharmonic: Kurt Masur conducts Strauss' “Metamorphosis” and Beethoven's “Symphony No.3”; 8pm; Jun 7 ● New York Philharmonic: Kurt Masur conducts Shostakovich and Beethoven; 8pm; Jun 9 ● *Opera/Ballet* Champs Elysées Tel: (1) 49 52 50 50

● *Ezio*: by Handel. Conducted by Robert King, directed by Stephen Medcalf and with the King's Consort. Soloists include James Bowman, Susan Gritton and Dominique Visse; 7.30pm; Jun 7, 9, 10

● *Opéra National de Paris, Bastille* Tel: (1) 47 42 57 50

● *Les Capulet et les Montaigu*: by Bellini. Conducted by Bruno Campanella and produced by Robert Carcen. Soloists include Jeffrey Wells, Cecilia Gasdia and Jennifer Lamore; 7.30pm; Jun 9, 12

● *Vienna* CONCERTS

Wiener Kammeroper Tel: (1) 512 0100

● Viennese Philharmonic Orchestra: with soprano Deborah Voigt and baritone Bryn Terfel. Giuseppe Sinopoli conducts Schoenberg and

exhibition that brings together art collected by the Farnese dynasty in the Italian Renaissance with statues, medals, coins and more than 130 paintings by the likes of Parmigianino, Brueghel, Sebastian del Piombo and Titian; to Aug 27

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Ian Davidson



To judge by the discordance of their public pronouncements, the disarray of the western allies over the hostilities in Bosnia now appears to be reaching panic proportions. The dispatch by Britain and other countries of substantial military reinforcements is no doubt intended to look like a strong response to the aggression of the Bosnian Serbs. But it is now difficult to believe in any outcome but an ignominious retreat of the UN peacekeeping operation from former Yugoslavia.

If that were to happen, the first consequence would be a comprehensive downgrading of the UN's future peacekeeping role. This might not be all bad if it meant the injection of a bit more realism into expectations of what the UN can do. Unfortunately, there is also a serious risk that the Atlantic alliance would be damaged as a by-product of a UN retreat.

After the emergency meeting in Paris on Saturday of western defence ministers, Mr Malcolm Rifkind, the UK defence secretary, declared that the Bosnian Serbs made a "massive miscalculation" when they took the UN peacekeepers hostage. It is hard to detect any solid justification for such bravado. He said that the Bosnian Serbs "have inevitably put themselves in the firing line", but we can only guess at what he meant by these words.

Did he mean that the British reinforcements are being sent to wage war against the Bosnian Serbs? Or that they are being sent to rescue the British hostages by force? Surely not. It may sound good to imply that Britain will smite the wicked. But Britain has no interest in fighting a war in Bosnia, and it has neither the mandate nor the military resources to do so.

The only reason Britain, France and the other countries have troops in Bosnia is to carry out a UN peacekeeping mandate, with no authority to wage war, and strict constraints on the exercise of military self-defence. The results of that mandate so far are at best controversial, at worst appallingly unsatisfactory. Quite a lot of civilians have been kept alive who might otherwise have died, and some people believe that this is sufficient

Retreat into panic

UN withdrawal from Bosnia could damage the Atlantic alliance

justification for the operation. But there is no peace, and it seems no nearer than when the UN peacekeepers were first sent out.

On the contrary, the military escalation by the Bosnian Serbs suggests it may be further away than ever. Considering that they have conquered 70 per cent of Bosnia by war, and are being offered only 51 per cent of Bosnia at the negotiating table, they have some reason to think they do better by war than by negotiation.

The extra troops being sent by western countries may

The initiative lies with those making war, not with those who want to make the peace

make the local UN commanders feel slightly more secure; they may even make them more secure in reality. The problem is that the main hostages held by the Bosnian Serbs are not the UN soldiers but the civilians in Sarajevo and the "safe areas"; and they cannot be defended against deliberate siege by peacekeeping methods. Any western commander who was tempted to raise the military stakes would know in advance that it would not take many casualties before public opinion at home demanded a halt.

The dispatch of reinforcements may improve the tactical options. But it will not change the strategic dilemma, which is that the initiative in Bosnia lies with those who are making war, not with those who would like to be making peace. The west does not have the authority, or the capability,

to impose peace on the warring parties and in the last resort, it does not have sufficient interest in trying to do so.

This is, no doubt, one reason why Mr Douglas Hurd, the UK foreign secretary, has warned that the sending of reinforcements might not work; and that if it did not work the UN peacekeepers would have to be evacuated with the help of Nato.

An evacuation would be a major military operation, since the end of peacekeeping would mean the end of all restraint and a renewed surge of civil war. Some of the combatants might try to prevent the departure of the UN forces, others might try to take away their weapons and supplies. In other words, the peacekeepers might have to fight their way out, and their exit might require an extra 50,000 troops, or twice as many as are there now.

No-one knows for sure whether Nato can meet the challenge of such an evacuation. In principle, the US has promised to provide half the ground troops needed. But under pressure from his critics in Congress, US President Bill Clinton has done so much ducking and weaving on the subject of American troop deployments in the past week that we cannot be sure that the promise is still good.

The reason is that the US and Europe have long been diametrically opposed on policy towards Bosnia. As a result, the end-game may turn into a no-win situation for the alliance. For if the US does send troops to rescue the Europeans from Bosnia, and in the process takes its share of casualties, the growing isolationism of rightwing Republicans will be massively reinforced, and America's commitment to Nato could be jeopardised. But if, on the other hand, the US does not send troops, it is Europe's commitment to Nato and trust in America which will be damaged, perhaps irreparably.

This would be a deplorable by-product of the civil war in Bosnia but it would put into perspective the long-running controversy over whether Nato should be enlarged to include the eastern Europeans, or whether instead we should give priority to our relations with Russia. Last week Nato seemed to have decided in favour of good relations with Russia. But the choice will matter much less if Nato itself is seriously damaged.

Why, you might ask, would the quaintly named Royal Society for the encouragement of Arts, Manufactures and Commerce (RSA), founded in 1754, have anything useful to say on the management of Britain's corporate sector in the late 20th century?

One possible answer is that the findings of its two-and-a-half-year-old inquiry, *Tomorrow's Company*, published yesterday, result from the co-operative effort and sponsorship of some of the UK's leading companies. A more compelling one is that the RSA has a vision of corporate activity that speaks more closely to the times than the 1980s vogue for a narrowly defined version of "shareholder value".

The Anglo-Saxon version of capitalism is desperately short of legitimacy. That, surely, is the lesson from the recent uproar over the pay of the directors of privatised utilities. The chief aim of the RSA's inquiry, under the leadership of Sir Anthony Cleaver of IBM UK, is to stimulate competitiveness. Yet it offers a view of the sources of sustainable business success that could help legitimise the wealth creation process in an increasingly hostile environment.

The starting point is the belief that business activity is changing in ways that make the management of physical assets less important. The role of people and relationships inside and outside the company is what will count for more in the 21st century. Future success, the RSA report argues, will depend on the proper management of the network of relations with employees, customers, suppliers, investors and the community.

This claim, unimaginatively dubbed "the inclusive approach", has much in common with stakeholder theory which refers to relationships with groups such as employees, suppliers and creditors as well as shareholders. But it does not imply that the other stakeholders must invariably be rewarded at the shareholders' expense in a zero-sum game. Nor, contrary to a hostile interpretation placed on the report yesterday by the Institute of Directors, does it advocate any form of accountability to stakeholders.

The message, rooted in the experience of individual participants in the inquiry, is rather that these relationships can be managed in a positive-sum way in the shareholders' interest.

A new report should provoke a reappraisal of corporate relationships, argues John Plender

A balanced vision for tomorrow

An obvious case in point is the history of the Unipart group in winning significant mutual cost reduction benefits in co-operation with its suppliers. Failure to manage such relationships may carry heavy penalties. The report declares that a company communicating with the various stakeholder groups in ways "not rooted in consistent values will expose itself to lack of credibility, loss of confidence and damage to its reputation". No prizes for guessing which privatised utility has paid the highest public price for failing to grasp that point.

As Professor Charles Handy of the London Business School has argued, the stakeholder analysis can be applied with equal force at country level. Against a background of severe US-Japan trade friction it tends to be forgotten that the export customers of many Japanese companies have been rewarded at the expense of their overworked employees and poorly remunerated shareholders. Japan's trade surplus is a reflection of a failure to strike a better balance between the different stakeholder interests, and has cost the Japanese policymaking elite legitimacy in the eyes of the electorate.

The strength of this analytical approach is that it appears to incorporate commonsense notions. Where the more extreme proponents of shareholder value appear to regard people and companies as commodities, the RSA report's emphasis on stakeholder relations highlights the organisational importance of qualities such as loyalty, trust and respect for the individual.

It argues that the British adversarial approach may be inappropriate in a world where careful management of human capital is a vital component of business success. The over-reliance on financial measures of performance is, it is suggested, potentially damaging to competitive performance. And the report accepts Professor John Kay's case, in *The Foundations of Corporate Success*, that continuity and



stability in relationships with employees, customers and suppliers are important factors in responding positively to change.

The inquiry found data to support these assertions. Bain & Company, the consultants, provided evidence of a close correlation between employee and customer loyalty. Statistical research on more than 3,000 businesses in North America and Europe tended to show that intangible factors, including intellectual property, innovation and quality, were the strongest motors of competitive achievement.

Research by the UK Department of Trade and Industry has found common features in nine out of 10 of the most successful companies. They are

led by visionaries, emphasise developing the creative potential of their people, know and exceed customers' expectations, and constantly introduce new, differentiated products and services.

Many companies responded to this by saying that "this is nothing new - we are doing it already". Yet the inquiry's findings revealed a big gap between what business leaders claimed they regarded as important and the priorities they set for themselves and their companies in practice. Another hindrance to putting the inquiry's recommendations into practice is that developing criteria to measure the less tangible factors that make for good business performance is a slow and difficult business.

Yet the one thing that the report claims is not an obstacle is the structure of company law. According to Philip Goldenberg, a partner at S.J. Berwin, one of the inquiry sponsors, many directors misunderstand their legal duties. They think that they have a legal obligation to shareholders which constrains their ability to manage stakeholder relationships to the company's advantage.

In reality, says Mr Goldenberg, the obligation to have regard to the interests of shareholders is not related to current shareholders, but to the general body of shareholders over time. It follows that directors ought to maximise the company's value on a sustainable basis. A failure to give due weight to important stakeholder relationships could thus constitute a failure by the directors to discharge their duty properly.

There is no great incompatibility here with the proponents of shareholder value - merely a difference of emphasis and an important question about how shareholder value is measured. The implicit message is that it will not do to say that what is good for shareholders is good for society unless shareholder value is defined in a way that reflects today's industrial and commercial reality as opposed to yesterday's. That reality is not being captured by the conventions of historic cost accounting which still dominate corporate reporting habits.

No doubt the RSA report will meet with plenty of criticism. It is eclectic, and makes no great claim to break new ground. The authors have a penchant for the kind of cliché that some business executives seem to need to cheer themselves into action: "thinking win-win" and "making things happen". There is a hint of mercantilism in some of the language on competitiveness. Yet the inquiry remains a good example of constructive, independent consciousness-raising, of a kind that is too rare in Britain. It will provoke many businesspeople into thinking about their role afresh.

LETTERS TO THE EDITOR

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We are keen to encourage letters from readers around the world. Letters may be faxed to +44 171-873 5938 (please set fax to "fine"). Translation may be available for letters written in the main international languages.

Japan welcomes car challenge in WTO

From Mr Ichiro Araki.

Sir, I agree with Sir Roy Denman (Letters, June 2) in that the US should not go alone on a non-legal route in trying to settle the bilateral trade dispute over automobiles and auto parts. Instead, as Sir Roy correctly points out, the US should address the issue of what it calls "discrimination" against imports in the Japanese market in the World Trade Organisation. Sir Roy furthermore wants Europe to join this action. Japan would not mind that, because we are convinced that an objective solution will be found within the multilateral framework based on international rules - particularly when third countries participate in the process.

However, there is one point that worries me about Sir Roy's opinion: that is, his reference to the 1982 General Agreement on Tariffs and Trade complaint filed by the European Commission. In his letter, Sir Roy seems to suggest that had the US supported the EC action then, the European view could have prevailed in the GATT. I doubt if that would have been the case. I checked the contents of the EC complaint in 1982 and found that the Commission requested Japan, among other things, to "adopt a general policy objective of increasing the volume of its imports, and in particular of manufactured goods".

In my view, it is a European version of the Clinton administration's "result-oriented" approach and the request for numerical targets or objective criteria, which run counter to

the fundamental principle of GATT/WTO rules. You cannot simply request a promise of the results in a "non-violation nullification and impairment" case of the GATT procedure.

Did the GATT contracting parties accept such a request in 1982? Of course not. The EC was not able to pursue its complaint in the GATT process to the end. No panel was established, and no rulings or recommendations were made. The US refusal to support the EC was a right decision, at least with regard to import targets.

If the US reverses its 1982 position and brings a similar request in the coming WTO consultation, Japan would strongly oppose that. And even in the unlikely event of European support to such a request,

the majority of the WTO members would most probably object to it. Setting up a numerical target for imports is nothing but an attempt to manage trade through government intervention. The GATT/WTO aims at securing exactly the opposite - free flow of trade in goods and services on a global basis.

Japan would certainly welcome the US challenge in the WTO concerning the auto issue, but the US should not repeat the EC's mistake 13 years ago.

Ichiro Araki, Deputy Director, Trade Policy Planning Office, Japanese Government Ministry of International Trade and Industry, Tokyo, Japan

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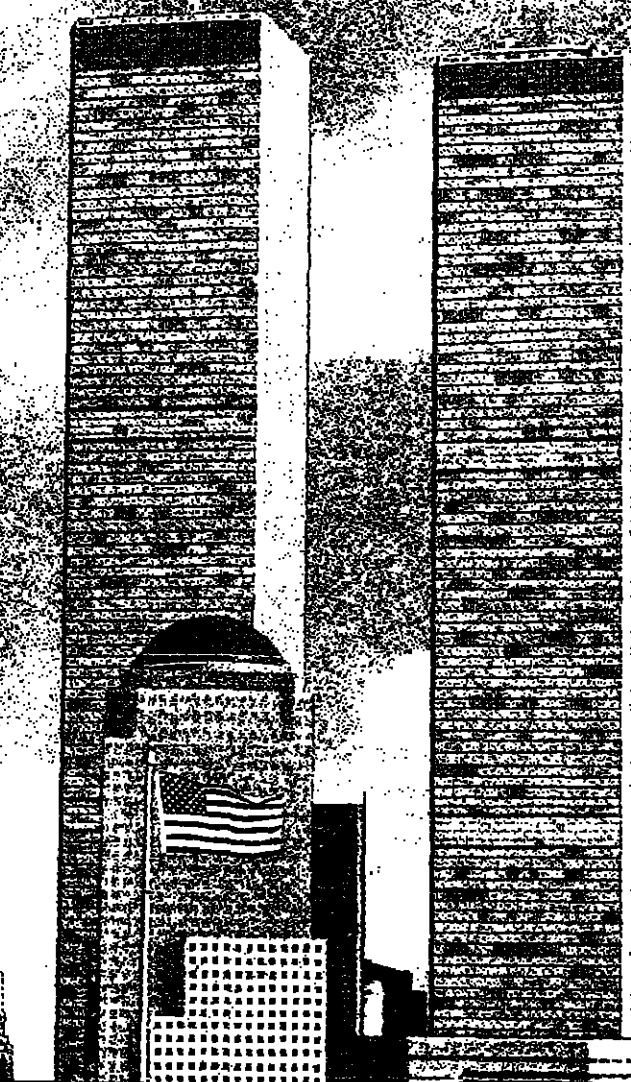
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FT1

Devolution takes far too long

From Mrs Linda Macnisch.

Sir, Perhaps the writer of your editorial "Consent for devolution" (May 30) could enlighten the Scots, who have expressed their desire for devolution at the ballot box, as to how this "consent" is to be obtained? If the democratic process has failed, time and time again, as it has, how exactly do the Scots proceed? Perhaps they should take to the streets? Well, they've done that too, periodically.

There is an old (very old) Scottish joke which goes: Question: "What is the difference between devolution and evolution?" Answer: "Devolution takes longer."

I have only got one life and I'm not spending all of it waiting for devolution, as my parents did. I vote for independence because that does not require the consent of anyone but the Scottish people, and I trust more and more Scots will come to the same conclusion.

Linda Macnisch, Roehampton, St Leonards Road, Forres, Moray IV36 6DW, Scotland, UK

Accountability of private prisons

From Mr Stephen Shaw.

Sir, Your report ("Privatisation of prisons set to save money", June 2) and leader ("Private prisons in perspective" on the UK government's prison privatisation programme presented it as the most normal thing in the world. In fact, privatised places of punishment raise profound issues of legitimacy and accountability. No other European country is engaged in prison privatisation - although there are a small number of private jails in the south and

west of the US and in Australia.

There are also serious questions about the competence of the private sector. The scrupulously impartial reports by Judge Stephen Tummim, the chief inspector of prisons, on the first two private jails - Wolds and Blakenhurst - demonstrate that the record to date has been decidedly mixed: neither as bad as some critics feared, but by no means as good as the proponents of privatisation predicted.

When it first embarked upon

prison privatisation, the government claimed the policy was experimental. It is therefore to be regretted that the contracts for the new prison at Fazakerley and Bridgend are to be granted for 25 years.

In effect, this guarantees privatised custody for the foreseeable future - whatever the results of the "experiment".

Stephen Shaw, director, Prison Reform Trust, The Old Trading House, 15 Northburgh Street, London EC1V 6AH, UK

Canny, but not quite such an old cove

From Mr Iain S. Robertson.

Sir, As that "canny old cove with experience" referred to by Lucy Kellaway in her analysis of Royal Bank of Scotland's advertising ("When age comes before beauty", June 5), I am glad that our new campaign was seen to stand out from the rest, not least because it uses

real Royal Bank people with whom our customers have built longstanding relationships. Also pleasing was the conclusion that the ad should bring in new business, because of its directness.

However, one small point: age before beauty certainly, but can I have my last 10 years

before retirement back please? A question of aged before time, perhaps?

Iain S. Robertson, managing director, corporate and institutional banking division, Royal Bank of Scotland, 138-142 Holborn, London EC1N 2TH, UK

Take flight from horror of portable telephones

From Mr K.A. Willson.

Sir, "Journey in space for passengers" (June 5) heralds the arrival of the ultimate travel horror, telephones at every seat!

Long expected but now here, the aeroplane had remained

that one haven of peace and escape from the portable telephone. Are we to endure the interference, annoyance etc. of being surrounded by frantic conversations or can we also expect the travel requisition to read: "Non-smoking, non-

telephone, window seat please?" K.A. Willson, commercial manager, Pinedale, Broomfield Road, Fleet, Hampshire GU15 8LS, UK

FINANCIAL TIMES

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Wednesday June 7 1995

Mr Lee leaps forward

This week's visit to the US by President Lee Teng-hui of Taiwan has sparked an inevitable outburst of protest from Beijing. Yet fear of upsetting China would have been a bad reason for the Clinton administration to refuse a visa to Mr Lee. The Beijing leadership may be used to a compliant legislature, but the US is different. President Clinton cannot ignore a resounding vote in favour of the visit by both houses of Congress. China is clearly concerned that even an unofficial visit to the US by Mr Lee will boost Taiwan's campaign for international recognition. And so it probably will, but only in a symbolic way. US officials will not meet Mr Lee. He has been discouraged from visiting New York, where the visit would attract more attention. As a sign that it wants other business to proceed as normal, the US has renewed China's most-favoured-nation trading status. Unless China chooses otherwise, Mr Lee's visit need not inflict lasting damage on the bilateral relationship.

Underlying the congressional vote on the visa, however, is a tide in US opinion which may make relations between the two countries more fraught. A Republican Congress is clearly reluctant to ignore the fact that Taiwan's record on human rights is better than China's. Taiwan's progress towards democracy, which is to culminate in presidential elections this winter, has also been noticeably faster.

Allowing Mr Lee to visit his old university seems a small gesture,

when Taiwan might arguably claim more tangible recognition. In particular, membership of the World Trade Organisation, which Hong Kong will continue to enjoy after 1997, is being denied to Taiwan. It ranks only slightly behind China in the ranks of world exporters and has virtually fulfilled the necessary conditions for membership, but it must wait until China does the same.

Such difficulties will continue as long as China and Taiwan cannot resolve their own relationship. The outside world does not want to have to go on making these awkward choices indefinitely. Although the process will inevitably be long, the best outcome would be a completely voluntary return by Taiwan to the Chinese fold. That is what China seems to want, but it must first make its regime much more acceptable.

There is a broader lesson too. It sometimes appears as though western leaders have taken fright at the prospect of China's emergence as an economic and political superpower even before the process has properly begun. The previous reluctance of the US to risk China's wrath by granting Mr Lee a visa can be seen in this light.

Yet if China is to become a dominant power, it will have to learn that there are limits to its ability to get its own way. That will not happen if the outside world kowtows to the wishes of a Chinese leadership that believes it has the right to dictate how others are to behave. If this means friction, so be it.

Scott inquiry

Mr William Waldegrave should not be compelled to resign because of the leaking of a draft of the report of the Scott inquiry into the "arms to Iraq" affair. But if Lord Justice Scott stands by his provisional conclusions in his final report, the political str will be even greater than that caused by the recent Nolan report into standards in public life.

It is too soon to debate the culpability of individual ministers and civil servants for the failings which led to the Scott inquiry. Sir Richard Scott sent out drafts of his report to give those concerned a chance to comment on matters of fact and interpretation. It may be that the drafts were leaked by individuals in Whitehall anxious to weaken the inquiry by premature publicity, but that is no reason to prejudice the final report.

Nor can there be any reasonable complaint about the procedure adopted by the inquiry, despite attempts by some former ministers to discredit the process in this way. The inquiry was established by the prime minister, who has notably refrained from criticism although himself under scrutiny. Sir Richard's conduct, of course, has been in keeping with previous investigations into executive failures, and the delay in publishing the report is fairly attributed to its complexity and the judge's evident desire to ensure that those concerned receive a fair hearing.

It is vital that the final report carries credibility, because of the importance of the issues at stake. Matrix Churchill may be the most

celebrated case, yet about a dozen prosecutions in all were launched against company executives concerned with the export of sensitive material to Iraq in the years running up to the Gulf war. But for the late revelation of evidence about the role played by officials, ministers and government policy, some of those charged would very likely have received prison terms.

Sir Richard has a duty to uncover the failures which led to this state of affairs and to expose any senior ministers and officials responsible. Of course the circumstances need to be taken into account, not least the sensitive politics of the Middle East and the need to protect hostages and others who might have been at risk. But official inquiries in Britain have rarely erred in making too little allowance for the pressures of government, and with the entire weight of Whitehall against him, Sir Richard is unlikely to veer in that direction.

The more serious concern is that the judge's report may concentrate too largely on the immediate cases, and too little on the wider issues involved. In what circumstances are ministers justified in refusing to disclose policy shifts to Parliament and the public? Is the current regime for public interest immunity certificates satisfactory? What are the responsibilities of junior officials who have knowledge of wrongdoing or are themselves confronted with ethical dilemmas? The Whitehall village culture is in the dock, not just Mr Waldegrave and a few colleagues and officials.

Opening skies

The modest relaxation of restrictions on transatlantic air travel agreed this week by the UK and the US is scarcely a giant step forward for "open skies" liberalisation. However, it is indisputably a setback for Mr Neil Kinnock, the European transport commissioner, who has been vigorously asserting his claim to conduct on behalf of EU members all air services negotiations with the US.

Mr Kinnock appears determined, nonetheless, to stand his ground. He is expected to threaten the UK with legal action of the kind he already plans against six other member states which have recently initiated bilateral agreements with the US. He contends such deals undermine the EU's solidarity and violate its airline deregulation policy.

The legal argument is for the courts to decide. But however they rule, the wisdom of Mr Kinnock's approach is debatable. Seeking to impose the Commission's will over the issue at this stage is not only likely to be resisted by EU member states, more important, it risks diverting Brussels' energies and political capital into pursuing a second-order objective which may be unattainable at present.

By dealing with the US, the EU might, as Mr Kinnock claims, be able to win bigger gains than its members can obtain individually. However, it would need far greater unity of purpose than it now possesses. For many of its larger members, the priority in transatlantic negotiations is to enhance the role of their bigger

airports. For smaller ones, it is to expand their carriers' access to the US market. In these circumstances, trying to forge a common front which satisfies all concerned looks a thankless - perhaps impossible - task.

Underlying these divergences is EU governments' longstanding tendency to regard their flag airlines as projections of sovereign power, and air transport policy as a means to promote the interests of carriers, not of their customers. Such attitudes will persist until Europe has a genuinely competitive airline market, ruled by efficiency instead of nationalism.

The planned full liberalisation of EU air transport in 1997 is an important step towards that goal. But the determined resistance by some member states to implementing earlier deregulation moves argues against taking its achievement for granted. It will never happen while EU governments are allowed to continue bailing loss-making state airlines out of bankruptcy.

The EU's first priority should be to enforce real competition and effective disciplines on state aid in the airline industry. These are the issues on which Brussels genuinely needs to assert its authority over member states. Once Mr Kinnock has shown he is up to that task, it may be appropriate for the EU to discuss its ambitions to play a bigger international role. Meanwhile, he should stop gazing wistfully at transatlantic skies and concentrate on those closer to home.

The timing of recessions is notoriously hard to predict. In July 1990, Mr Alan Greenspan, the Federal Reserve chairman, told Congress that "the likelihood of a near-term recession seems low". Statisticians subsequently marked that month as the end of the business expansion of the 1980s.

Nearly five years later, the economy again appears to be faltering. Speculation about a possible recession came to a head on Friday when the Labour Department reported a 101,000 decline in payroll employment last month. This contrasted adversely with Wall Street projections of an increase of between 150,000 and 200,000 jobs and followed ominously weak figures for factory orders and the Purchasing Managers Index - a reliable guide to sentiment in manufacturing industry.

The sharpness of the decline in economic activity since April is unsettling many US economists. But most remain fairly confident that the economy will rebound before the end of the year. The bond market, however, seems far more pessimistic. The structure of yields implies a half-point cut in the federal funds rate to 5.5 per cent within a matter of weeks and subsequent cuts to perhaps 4.5 per cent within four or five months.

It would be surprising if the Fed rushed to validate these bearish interest rate projections because the economic dislocation so far experienced is roughly what might have been expected following its decision last year to tighten monetary policy. The Fed raised short-term interest rates from 3 per cent to 6 per cent during the year to February because it wanted to cool the economy and reduce upward pressure on inflation.

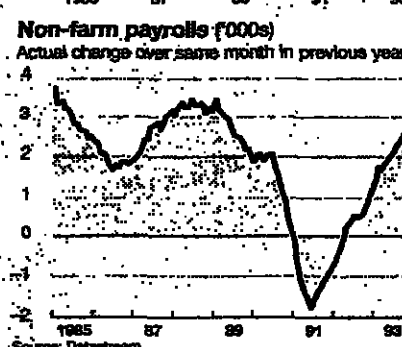
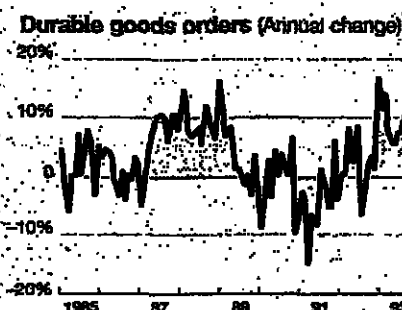
The rate increases first reduced the growth of consumer spending, especially on interest-rate sensitive items such as cars, homes and durable goods. This meant that production ran ahead of sales growth, creating a large backlog of inventories, or stocks of unsold goods. Early this year companies began to cut production in order to reduce these stocks. As production fell, demand for labour also declined, causing higher unemployment.

The softness in recent data may thus reflect nothing more serious than a temporary "inventory correction" - a phenomenon familiar from past business cycles. Such a mid-cycle correction might involve a couple of quarters of very sluggish growth at an annual rate of, say, between 1 per cent and 2 per cent. It could even mean a brief contraction of activity: many past business cycles have seen the odd negative quarter following a bout of Fed tightening. But once the inevitably bumpy transition to slower growth

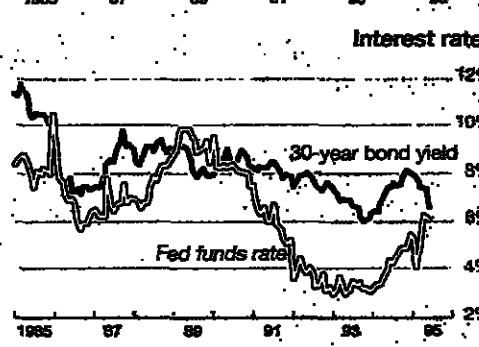
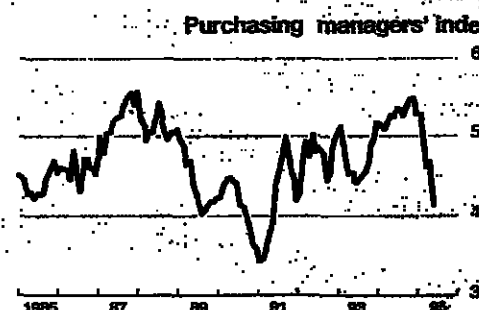
Loud ring on the US alarm bells

Some figures suggest another recession but others point to renewed economic growth, says Michael Prowse

US economy: will history repeat itself?



Source: Department



Source: Department

is completed, production and employment should rebound. The problem for the Fed is that the early stages of a real recession look similar to an inventory correction: both involve cuts in production in interest-rate sensitive sectors. The difference lies mainly in consumer behaviour. The Fed will be closely watching figures for retail sales: if these weaken further in May and June, the risk of a recession would rise sharply - because lower sales would almost certainly be followed by another round of production cuts. The Fed would then lower interest rates in order to ward off a downward spiral.

So far, however, the signs are moderately encouraging. Figures for final sales in the first quarter were revised up sharply last week to show growth at an annual rate of 2.5 per cent, rather than 1.8 per cent. Second quarter data are patchy. Car sales plummeted in April, but rebounded in May. Department store sales seem to be doing reasonably well. Consumer spending may also have been arti-

ficially depressed between February and April by unusually low tax refunds and other fiscal distortions.

Consumer confidence indices also suggest that fears of recession are more prevalent on Wall Street than Main Street. Confidence fell a little last month but remained at levels that normally signify solid economic growth.

There are other reasons why the Fed may want to wait before cutting rates. Core consumer prices rose at an annual rate of more than 4 per cent in the first four months of this year, against about 2.7 per cent last year. Fed policymakers have indicated they would be willing to cut interest rates while inflation was rising if broader economic trends - such as an imminent recession - indicated the rise would be short-lived. But given the uncertain economic outlook today, they will probably require more evidence that underlying inflationary pressures are easing before loosening monetary policy.

The monetary authorities will also be acutely conscious that many

powerful expansionary forces are already at work. The Fed may not have cut the federal funds rate - the cost of overnight loans for banks which it controls directly by buying and selling securities. But this short-term rate forms only a part - some would say a minor part - of the monetary transmission mechanism. On the assumption that economic growth is slowing substantially, the bond and currency markets have already wrought a dramatic de facto loosening of US monetary policy.

Yields on bonds of most maturities are now below 6 per cent - below the federal funds rate. The yield on the benchmark 30-year Treasury bond has fallen to about 6.5 per cent, having soared above 8 per cent last year. Mortgage rates are back below 8 per cent, having risen to about 9.5 per cent. The dollar - another important channel for monetary policy - has depreciated by about 9 per cent in trade-weighted terms from already depressed levels last year.

The effects of such rate changes

are not immediate. But just as higher long-term yields in 1994 caused this year's slump, so lower yields today should lift the economy later this year and next year. The interest-rate sensitive sectors that have been hardest hit in recent months, such as cars, housing and consumer durables, should benefit disproportionately. Lower bond yields may also support capital spending by allowing companies to borrow long term at attractive rates. The fall in the dollar, meanwhile, is likely to boost foreign demand for US products: many economists are already forecasting a sharp reduction in the US trade deficit later this year.

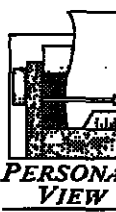
There are other grounds for optimism. The "wealth effect" from higher share prices is disputed, but the scale of this year's rally is large enough to have some positive effect on consumer spending. Tentative signs that Mexico's financial crisis is easing should also support economic activity in coming months. Nobody is sure quite how big an impact Mexico's economic free fall had on the US, but it certainly exacerbated the inventory shake-out caused by tighter monetary policy.

An apparent absence of many classic signs of impending recession should also comfort the Fed. Consumer debt has risen but corporate and household balance sheets are generally in good shape. Although the bond and share markets look frothy, there is no evidence of speculative excesses in real estate markets. Companies still appear to be taking a long view: there are few signs yet of a slowdown in capital spending.

The balance of evidence thus still points to a mid-cycle correction rather than a full-blown recession. And although news reports understandably focus on job losses, the Fed is aware that the economy is still uncomfortably close to its resource limits: the jobless rate is 5.7 per cent, probably still below the rate consistent with stable inflation; and the industrial capacity utilisation rate is high at about 84 per cent.

There is certainly a danger that the economy could spiral down into recession. But if consumer spending holds up - an important proviso - there is also a risk of a stronger-than-expected rebound once inventories reach desired levels. Given the uncertainties the Fed seems likely to wait a month or two before considering a rate cut. This, at any rate, would be the prudent course for an institution whose primary responsibility is price stability. In the meantime markets, by lowering the rates they control, are fighting recession in their own inimitable fashion.

Why Britain should opt out of Emu



PERSONAL VIEW

European monetary union is a leap in the dark. Never before have countries with independent monetary policies and long-standing central banks planned to establish a common central bank, and to give to that bank exclusive control over monetary policy and the issue of currency.

The Institute of Directors will tomorrow publish a detailed assessment of the likely implications for the British economy of Emu - whether the UK opts in or opts out. Our conclusion is that, on balance, it will not be in the economic interests of the UK to take part in a single European currency for the foreseeable future.

The UK economy is structurally different from those of other countries likely to take part. Our trade pattern is different - we trade much more outside the EU than other likely participants, who trade much more with each other. Further, the UK economy responds differently to changes in interest rates from the

economies of continental Europe. This means that for the UK the costs of a single currency will be higher - and the benefits lower - than for these other countries.

The main cost of a single currency would be relinquishing control over monetary policy. This is unlikely to pose difficulties for the so-called EU "core" of Germany, France, the Netherlands, Belgium, Luxembourg and Austria - the countries most likely to be the first to move towards a single currency. Since their economies are similar and tend to move together, the appropriate monetary policy is also likely to be similar.

This is not the case for the UK economy. It does not move in step with these countries and is structurally different in the ways outlined above. The appropriate stance of monetary policy will therefore often be different in the UK - yet participation in Emu would impose a European monetary policy.

The costs to the UK of being subject to an inappropriate monetary policy could be very large indeed. If it is too tight, there will be the costs of lost output and employment; if it

is too lax, there will be the costs of inflation.

It is not just that the appropriate monetary policy is likely to be different in the UK; changes in monetary policy will affect the UK differently from other European countries. So, even if inflationary pressures in the UK and other participating countries were the same before a change in monetary policy, they would not be afterwards.

The benefits of low inflation could still be achieved by pursuing a sensible domestic monetary policy

Consumers and businesses in the UK have a much greater reliance on variable rate debt than their German or French counterparts because of the nature of our housing and financial markets. The immediate effect on incomes and spending of a given change in interest rates is therefore greater in the UK than in these countries.

A single currency would clearly reduce the costs and uncertainty associated with currency exchanges in international trade.

However, less than half of total UK trade is with other EU countries - even including the three new EU members. If one restricts the analysis to the EU "core", this proportion is reduced to just 30 per cent. So, if the UK joined this first group of countries in Emu, 70 per cent of our trade would still be subject to a currency exchange.

There is no evidence that this 30 per cent share would increase significantly if exchange rate uncertainty among the countries concerned were eliminated. Various studies have failed to find any robust relationship between exchange rate variability and trade.

A single currency would give rise to additional costs in the shape of the fiscal transfers likely to be demanded by countries experiencing difficulties as a result of giving up their domestic monetary policy. The consequence of this would be an additional layer of tax on what is already an over-taxed Europe. This would exacerbate existing problems

of high unemployment and poor competitiveness.

What would happen if the UK exercised its opt-out and did not take part in Emu?

The benefits of low inflation could still be achieved by pursuing a sensible and credible domestic monetary policy. Furthermore, the role of the City of London as a world financial centre and the UK's success in attracting inward investment could be more easily maintained. This is because the UK would be free to pursue policies of light regulation and low taxation in which the City could thrive, and to provide the stable macroeconomic climate and flexible labour markets sought by foreign investors.

A single currency is for ever. The burden of proof must be to show, beyond all reasonable doubt, that it is in our economic interest to take part. The evidence shows that, on balance, it would be in our economic interests not to do so.

Tim Melville-Ross

The author is director-general of the Institute of Directors.

OBSERVER

Jerusalem jive for Kohl

Germany's chancellor Helmut Kohl probably didn't have much time to listen to the radio yesterday while in Israel. Just as well, for some inexplicable reason the state-owned radio station broadcast a medley of songs favoured by the allies in the second world war.

Tunes such as Roll Out the Barrel, The White Cliffs of Dover, Colonel Bogie and Hang Out the Washing on the Siegfried Line, along with some well-known hits of the Red Army choir, filled the ether. Aliza Disantnik, editor of the golden oldies programme, saw nothing odd about her choice of music. Was she making a point about Kohl's visit? "I hadn't even thought about it," she said.

Water off a duck's back, during Kohl's visit, Volkswagen announced \$100m investment in a joint venture with an Israeli company to make magnesium parts for cars. Maybe Disantnik will now think about playing that old Abba favourite - Money money money.

Georgian kicks

After four years of war, food shortages and economic slump, it's a small miracle that Georgia's national soccer squad can field 11 players at all - let alone a team that was capable, during their

first-leg encounter last November, of trouncing Wales 5-0.

Four of the players appearing in Cardiff today were among the 250,000 or so Georgians forced from their homes in the republic's north-west, after Georgia lost a war against the Abkhaz separatists in August 1993.

Shortages of power, heating oil, and water, along with rampaging armed gangs, have made Georgia's soccer season somewhat difficult. Though Dynamo Tbilisi, which inflicted a famous defeat on Liverpool in 1981, is still struggling on. And despite their tender average age - about 23 - most of the team members have established successful careers abroad.

Asked to name Georgian head of state Eduard Shevardnadze's bravest moment, most Georgians think not of the Abkhazian war - during which he had several close shaves - but of the time 15 years ago when he walked, unarmed, on to the pitch of Tbilisi football stadium, which had been invaded by a mob of enraged fans seeking the Russian referee's blood. Shevardnadze managed to cool tempers.

A Georgian indignantly denies his country's fans are particularly fanatical - the English are far worse, he insists.

Very small Mac

Where's the beef? Andrew Taylor, 37, chief operating officer of

McDonald's Restaurants in the UK, has been appointed to the main board of McDonald's Corporation. For a graduate trainee who only started in 1978, Taylor's rise to the top of a company with a market capitalisation of \$28bn looks impressive.

McDonald's issued a press release yesterday celebrating the fact that he is the first Briton to make it on to the main board. What it fails to point out is that Taylor has joined the board as an advisory director, for a one-year term, and in a non-voting capacity. When his time is up someone else will probably be given a go.

If a Brit ever gets a permanent seat on the McDonald's board, Observer will eat not the cheeseburger - but the cardboard box it comes in.

It's never too Luyt

Louis Luyt, outspoken president of the South African Rugby Football Union, may not be entirely upset at the rows of empty seats at the world rugby cup venues.

Shortly before the competition started, he criticised the directors of Rugby World Cup Limited, the body ultimately responsible for organising the event. Almost half a million tickets had unexpectedly returned to South Africa, barely a week before the tournament started - and Luyt was livid. "Just as we thought, the

tournament has been seriously over-priced... not nearly as many people are coming from overseas as RWC expected," complained the 63-year-old Luyt, who in his youth captained the Orange Free State provincial rugby team. "Rugby world cup have creamed off the best tickets and left us to try to sell the rest. They did the same thing in 1991," he added.

Luyt, a businessman who made his fortune from fertiliser, is renowned in South Africa for not mincing his words. Apparently he went on to call for the resignation of the RWC directors and for the restructuring of the RWC itself.

Or did he? Following a pointed response from the RWC, Luyt then issued a statement apparently denying much of what he had said. Asked yesterday whether his original remarks about the RWC represented his true feelings, Luyt's office said that any comment must now await the end of the tournament. Someone has some explaining to do.

Small shareout

Quote of the week, from French political scientist Dominique Moisi, speaking at London's Royal Institute of International Affairs yesterday: "The trouble with Europe is that we are all willing to share what we don't have. The French are willing to share money, and the Germans are willing to share foreign policy."

100 years ago

French cable companies strenuous efforts are being made by the French Colonial Party to force the Government to introduce an extensive system of submarine cables in order to avoid having to depend upon the English lines in case of war, a necessity which is declared to be a great national danger. It is now stated that considerable opposition will be offered before the Budget Committee to the renewal of the subsidies paid to the English cable companies, of which the principal are the Spanish Submarine Telegraph Company (cable to Senegal), the Eastern Extension Company (Saigon and Tonkin), the Africa Direct Telegraph Company (West Coast of Africa), and the Eastern Telegraph Company (Cable to Berlin). It is contended that this money should be devoted to French cable companies.

50 years ago

Round the markets. Stock Exchange markets will be "political" for the next two or three weeks. The general opinion in the House [the exchange] is that price fluctuations will be of the switchback order. The speech of Mr Attlee [Labour party leader] on Tuesday night led to a weakening of prices around the House.

Japan admits bad debts problem totals \$469bn

By Gerard Baker in Tokyo

One of Japan's most senior financial officials has acknowledged that the full scale of the country's bad debt problem is far worse than previously thought.

Mr Yoshihisa Nishimura, director-general of the finance ministry's banking bureau, yesterday said total problem loans at the country's banks amounted to about ¥40,000bn (\$469bn).

This is equivalent to almost 10 per cent of Japan's gross domestic product.

The disclosure came amid growing concern that the government's long-awaited measures to reinvigorate the troubled banking sector are unlikely to be sufficient to resolve the problem.

Mr Nishimura told a parliamentary budget committee that the scale of the crisis meant a publicly funded emergency rescue of a troubled bank or two was increasingly probable. "It may be necessary in order to maintain financial order," he said.

But Mr Masayoshi Takemura, finance minister, was more circumspect about such a highly controversial use of public money.

"I would like to consider this issue cautiously in light of the

direction of public opinion and the course of parliamentary debate," he told the same committee.

The figure of ¥40,000bn is the total of all outstanding problem loans, for some of which banks have already made provision.

The overall cost to the banks is therefore likely to be lower than that figure, but will still be substantial, probably higher than

Surplus falls for second month Page 4

the \$100bn cost of the rescue of the US savings and loans industry over the past decade.

The banks' bad loans are the result of imprudent lending on a grand scale in the 1980s, a period of surging asset prices, mostly to the property sector.

When property prices fell in the early 1990s, banks were left with large volumes of non-performing loans, the scale of which they only began to disclose two years ago.

Since land prices are still falling, and economic recovery remains elusive, many institutions are gradually slipping below the solvency level, despite stronger recent efforts to write off their bad assets.

Institutions of all types are at risk, including some of the smaller "city" or commercial banks, trust banks and at least one long-term credit bank.

But the greatest immediate threat is to housing loan companies, some regional banks and smaller credit associations, many of which are now near collapse.

The scope for a US-style bailout has been greatly limited by public opposition earlier this year to a Bank of Japan-led rescue of two small credit associations.

It subsequently emerged that the collapse of the Tokyo Kyowa and Anzen credit unions had been brought about by alleged improprieties on the part of the managements of the two companies.

The incident hardened the electorate's suspicions that most banks' problems were the result of their own incompetence or alleged venality and should not be resolved by public funds.

The fragility of the financial system, which is threatening to snuff out Japan's already weak economic recovery, demands action of some sort from the authorities.

From this financial year, banks will be required to disclose the scale of restructured loans.

Moscow may look overseas to aid energy industry

By John Thornhill in Moscow

President Boris Yeltsin yesterday signalled an increasing Russian openness to foreign investment in its asset-rich but crisis-prone energy sector.

Russian suggestions about encouraging foreign participation in its energy sector coincide with an increase in official criticism of the country's domestic producers.

Mr Yeltsin, addressing an international energy conference in Moscow, said European energy problems could be solved "only through joint efforts".

Mr Anders Aslund, a former economic adviser to the Russian government, said yesterday: "Mr Yeltsin appears to be worried about the performance of the energy sector and the best way of squeezing it is by liberalising the industry and allowing in foreign investment."

Western companies invited to the meeting included Total, British Gas, Elf Aquitaine, Ruhrgas, Shell, Norsk Hydro and Winterhalde. Several are believed to be interested in buying a stake in the giant Gazprom gas producer, which is aiming to sell 9 per cent of its shares to international investors.

Mr Yuri Shafrenik, the fuel and energy minister who also addressed the conference, said the main challenge confronting Russia's energy industry would be to try to halt the fall in oil output. Even if drilling work doubled, Mr Shafrenik said, oil production could still be expected to drop from last year's 318m tonnes to 27m-310m tonnes by the end of the century.

About 27 per cent of Russia's oil wells are out of operation as a result of cash shortages and its pipeline infrastructure is crumbling badly. Refineries are working at less than 55 per cent of capacity. Industry analysts estimate it could take at least \$15bn of capital to revive production.

Mr Shafrenik suggested the gas industry was faring better. Annual production might rise from the current 607bn cubic metres a year to between 660bn-740bn cubic metres by the year 2000, he said.

At its recent annual meeting, Gazprom indicated it was in no hurry to sell shares at low prices and was initially targeting foreign energy companies rather than institutional investors.

Bureaucratic delays, an uncertain fiscal and legal regime, and changeable tariffs have frustrated many foreign investors in Russia's energy sector. But parliament is considering important production-sharing legislation which might clear the way for foreign investment projects in the Timan-Pechora basin in Russia's Arctic circle and Sakhalin island in the far east.

A world concern, Page 2

Nafta ministers meet to discuss Chile's admission

By Bernard Simon in Toronto and Nancy Dunne in Washington

Trade ministers from the US, Canada and Mexico meet today for the start of negotiations on Chile's accession to the North American Free Trade Agreement.

Chile could join Nafta as early as January 1 1996 if the talks go smoothly, but the negotiations are clouded by demands in the US Congress that some Nafta provisions be redrawn to impose new conditions on US-Mexico economic relations following Mexico's financial crisis.

Canada and Mexico want to leave the 17-month-old Nafta agreement virtually intact, with only technical modifications such as a possible name change and

new voting procedures in side-pacts on labour and the environment.

Republican leaders in Congress have indicated that they will not grant the Clinton administration "fast-track" negotiating authority for Chile's accession unless the labour and environment side deals are excluded.

One compromise being mooted is that the trade element of an expanded Nafta would be subject to fast-track approval. Fast-track authority enables the US administration to negotiate a full package to be voted on by Congress without amendment.

Today's meeting will review the last six months' preparatory work and will be followed by the annual ministerial meeting of the

three Nafta members.

On the agenda are a stalled proposal for tariff reductions among the US, Canada and Mexico, a code of conduct for members of dispute settlement panels, and trade disputes.

Mr Mickey Kantor, the US trade representative, is expected to take up a complaint by UPS, the US courier service, against Mexican restrictions on the size of vehicles allowed to deliver small parcels.

He is also likely to reiterate Washington's concerns about Canada's farm "supply-management" system, which protects local producers of eggs, poultry and milk. Washington and Ottawa are also embroiled in a dispute over sugar.

GM plans pan-European works councils

Continued from Page 1

had invited union representatives at its production plants in Germany, the UK, Austria, Belgium, Norway, Portugal, Sweden and Spain to talks in Brussels on the formation of an "employee forum" which will be involved in an "exchange of views on the development of the business and the competitive challenges facing" GM Europe.

GM's decision to include employees at Vauxhall, its UK subsidiary, in the works council comes as a blow to the UK gov-

ernment's opt-out from the Maas-tricht treaty's social chapter. Under that exemption, companies are not required to extend a works council to UK employees.

Mr Tony Woodley, the TOWU union national secretary for the UK car industry, said GM's decision had "exposed the dishonesty and stupidity of the UK government's refusal to legislate for works councils".

Mr Bruce Warman, Vauxhall's personnel director, said there had been a "long discussion" in GM about whether to exclude the 11,000 UK employees in line with

the UK's opt-out. He said management had decided not to do so but reserved the right of going ahead without UK representation if agreement could not be reached with British unions.

The proposed forum is seen by the company as a "complement" to existing practices at a transnational level.

GM plans later to establish consultation forums for employees in Europe who work in its components division Delphi, EDS computer business, Delco Electronics, Hughes aircraft missile facility, and its finance group.

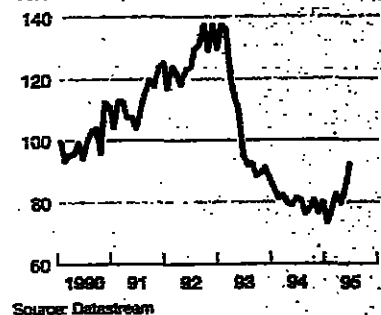
THE LEX COLUMN

Beer money

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John Labatt

Share price relative to the Toronto Composite Index



Source: Datastream

Labatt has attracted two bids in under three weeks. Yet the extent of its attraction looks questionable. Of course, the private Belgian brewer Interbrew, like earlier bidder Unex, plans to sell Labatt's bizarre mix of broadcasting and entertainment businesses. This could knock around C\$800m off the C\$2.7bn bid price. Additional funds could come from selling around 550 British pubs. But it is hard to equate the remaining businesses with their implied valuation.

Labatt accounts for 44 per cent of Canadian beer sales, and has steadily increased its share of a stagnant market. But there is a growing threat of US competition within what has been a well protected market. Its margins, possibly the highest of any sizeable brewer, must be under threat. Its 22 per cent stake in Mexico's largest brewer, Femsa Cerveza, was acquired just before the peso crisis; the company faces intense domestic competition. Meanwhile, Labatt has made limited inroads into the European market. In the circumstances, it is hardly surprising that after some time on the auction block no other large brewer bid.

Interbrew is paying a premium for the opportunity to sell its vast array of premium beers into a growing segment of the North American market. Labatt offers both brewing and distribution. Interbrew can do more with the Labatt and Rolling Rock brands in Europe. In addition, as a private company, Interbrew can take a longer-term view on investments. But its three family shareholders could require a lot of patience.

French banking

The idea of merging BNP, UAP and Suez to create a huge tricolor-waving financial conglomerate is typically French. Fortunately it now seems to have been blocked, but it could resurface in some other form. Size for size does not create strength: Crédit Lyonnais' attempts to create a French rival to Deutsche Bank ended in catastrophe. Moreover, none of the three groups is a leader in its main markets: tying three stones together does not make them float any better.

There is some theoretical appeal in breaking up Suez, if that is what BNP driving at. Suez is an historical accident, a rag-bag of directionless businesses containing few synergies. If a break-up released value, shareholders would be delighted: since 1990, the stock has underperformed the CAC-40

by 80 per cent. BNP would also be able to keep Banque Indosuez, allowing it to catch up with Société Générale in investment banking. But disposing of Suez's other assets would not be easy. Crédit Lyonnais, which is trying to sell similar businesses, has discovered this is a buyers' market. Besides, the tax implications of such sales might prevent much of the value reaching shareholders.

If nothing else, the aborted merger plan has highlighted Suez's strategic predicament. The company is sitting on about FF85bn of cash. The management views the option of distributing cash to investors as lacking in imagination. But dullness is not vice. Shareholders have suffered enough from Suez's strategy of frittering money on minority holdings in unrelated businesses.

UK electricity

Panic is gripping Britain's utilities. Political criticism of high profits and rising executive salaries is forcing them to sue for peace. The latest peace offering comes from electricity group Seeboard. It has followed the practice, pioneered by North West Water, of splitting "unforeseen cost savings" between customers and shareholders. Unlike North West, which went for a notional 50:50 split, Seeboard is giving customers two-thirds of the goodies.

If this manoeuvre removes the threat of tougher action by the regulator, it will be in shareholders' interests. As in North West's case, the key is not so much the special dividend as the other goodies in prospect. Seeboard's ordinary dividend, which rose 23 per cent last year, has scope to

grow further as dividend cover is reduced; there is the hint of share buybacks to gear up its balance sheet to more appropriate levels; and investors will receive Seeboard's shares in the National Grid when it is floated. Viewing the package as a whole, shareholders do better than the rhetoric of a 33:67 split suggests.

However, all this hinges on the assumption that Seeboard can sue for peace on such terms. The risk is that Mr Stephen Littlechild, the regulator, will see Seeboard's offer as an opening bid and press even harder. He might, for example, argue that excess profits are higher than Seeboard's 23m of unforeseen cost savings or insist on customers receiving an even bigger share. There is nothing magic about Seeboard's maths.

UK lottery

Britain's National Lottery gave out around £562m of prize money in the year ended March, but the largest individual beneficiary only emerged yesterday. Camelot - the operator, owned by companies including Rascal and Cadbury Schweppes - was sufficiently embarrassed by its luck to change accounting policies. Rascal's own accountants calculated Camelot's 1994-1995 pre-tax profits at £37.3m. But Seeboard's 1994-1995 pre-tax profits were £20m start-up costs, declaring only £17.3m profit. The extent of its fortune should emerge this year, with likely profits of around £30m.

There is no reason why Camelot should not be rewarded thus. It won the licence in a competitive tender, exceeded its sales targets and provided £30m additional funding for "good causes". Nonetheless, the tide of public resentment that has swept over utilities is now reaching Camelot, raising the spectre of windfall taxes under a Labour government. But at least Camelot has the short-term prospect of putting more games and services through its expanding sales network. And there is the potential for operating overseas lotteries.

The more immediate corporate losers are other leisure companies. With over £100m a week being absorbed by the lottery, bingo, pools and betting businesses are all starting to see dwindling revenues. They will eventually benefit. Having encouraged one form of gambling, the government has felt obliged to speed up deregulation within the entire gaming industry. But tomorrow's jam is coming at the expense of today's profits.

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FT WEATHER GUIDE

Europe today

Colder air and rainy periods will be drawn into the UK, north-west France and the Benelux as a small depression crosses the North Sea towards southern Norway. In the colder air, cloud will be interspersed with sunny spells and there will be occasional showers. Germany, northern France and the northern Alps will be mostly cloudy. The Mediterranean and southern Alps will have a lot of sun but Portugal and eastern Spain will be partly to mostly cloudy with rain, occasionally with thunder. The Balkans will have broken cloud mixed with showers and a few thunder showers. Southern Scandinavia will be cloudy and rainy.

Five-day forecast

A depression near southern Norway will cause steady rain over southern Scandinavia. A high pressure area will move west of the UK resulting in more stable conditions over the British Isles. The Benelux will remain unsettled as colder air crosses central Europe. Rainy periods will spread east. The central Mediterranean is expected to have rain or showers during the weekend. However, the Balkans should turn dry this weekend after a couple of showery days.

TODAY'S TEMPERATURES

Location	Temp	Location	Temp	Location	Temp	Location	Temp
Madrid	30	Paris	18	London	15	Amsterdam	14
Berlin	15	Frankfurt	18	Geneva	15	Brussels	14
Barcelona	21	Madrid	24	Paris	18	London	15
Amsterdam	14	Frankfurt	18	Geneva	15	Brussels	14
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Barcelona</							

\$50bn, though its gains on bonds will have been offset by losses on the dollar-yen exchange rate. The BoJ can deflate the yen bubble only by transferring the air pressure into dollar bonds, and then pouring it into the global securities markets.

Incidentally, the last time that Japanese government bond yields reached this low was in May 1987, after which they doubled inside a few months. That bear market in bonds helped to trigger the 1987 global stock market crash. When JGB yields got down to 3.1 per cent in January 1984 there followed the bond market crash. Now they are at 2.6 per cent again.

What follows later in 1995 may not be as violent as a crash, but plainly the markets are out of line and they are beginning to look dangerous.

If the US economy bounces back from what turns out to be nothing more than a sharp inventory correction, the US Treasury bond market will be very exposed. If the US economy stays flat, and Japan stays in trouble, the world economy will be looking sick and equities will have bear the brunt of the realignment. Place your bets, please.

INTERNATIONAL COMPANIES AND FINANCE

BNP and UAP in talks over Suez

By Andrew Jack in Paris

Banque Nationale de Paris and Union des Assurances de Paris, two of France's largest financial groups, are actively considering a closer relationship with Suez, the country's largest financial and industrial holding company in which they both hold important stakes.

The plans come in spite of their denials of reports in the French press of a specific three-way merger plan drawn up over the past few weeks and abandoned after intervention from the French government.

BNP and UAP both stressed in statements the importance of the future strategy and profitability of Suez, and did not deny they were in discussions over a possible restructuring.

Over recent months the growing interest of BNP in Suez has become one of the biggest open secrets in the financial marketplace. BNP has increased its stake to about 5 per cent in the past six months.

Mr Michel Pébereau, BNP's chairman, has repeatedly refused to elaborate beyond the wording of a carefully-drafted statement saying the bank's interest has always been simply for investment purposes.

The French government was swift on Monday to deny suggestions that it had discussed the idea of a large-scale merger between the three institutions, let alone that it had blocked its development.

In a country gripped by the idea of the power of a closely-knit elite - a presidential campaign theme used with effect by Mr Jacques Chirac - there



Moving closer: Gérard Worms of Suez (left), UAP's Jacques Friedmann and BNP's Michel Pébereau

is certainly scope for speculation about the political undertones of further machinations between BNP, UAP and Suez.

Mr Pébereau - who is an *inspecteur général des finances*, the most senior rank of French administrative elites - has been closely linked to Mr Edouard Balladur, the former prime minister, and some suggest he built up BNP's stake in anticipation of Mr Balladur winning the presidential race.

Mr Jacques Friedmann, chairman of UAP, is also an *inspecteur* and a long-standing ally of both Mr Chirac and Mr Balladur. Some commentators have placed significance on his visit last week to the Matignon office of Mr Alain Juppé, the prime minister and one of his protégés.

However, even if personal connections could prove important in smoothing any final action, there are plenty of purely financial reasons why Suez appears a tempting target for restructuring.

Most notable is the substantial discount of the share price of Suez to its net asset value, in turn reflecting a series of disappointing financial results including a FF4.7bn (\$654.02m) loss and a FF7.6bn provision for 1994 to allow it to withdraw entirely from the property sector.

For BNP, there is a particular attraction. Banque Indosuez, an investment bank controlled by Suez, would give BNP a way to strengthen its own investment banking arm, capital market activities and network in Asia.

Mr Gérard Worms, chairman of Suez, argues that losing Indosuez would be "very damaging" to his group, in which he argues it has a future as a niche player.

Indosuez is not without problems, however. Ironically, IBCA, the European rating agency, yesterday downgraded the bank over concerns about whether its property portfolio was adequately provisioned.

and uncertainties about its capital markets activities.

Mr Worms also suggests that a hostile takeover of Suez by BNP would be too dilutive for the latter's shareholders. Hence the need for BNP to find allies, which could be drawn from Suez's existing larger owners, including St Gobain, Elf Aquitaine and UAP.

For UAP, a direct takeover has less obvious relevance since Suez divested its insurance interests - most notably Victoire, which was sold to Commercial Union of the UK last year.

However, the group is believed to be interested in reinforcing its financial links.

In general, the pressure for change comes at a time when there is growing pressure from investors to seek better returns - not least those at UAP who have been disappointed by its performance after its privatisation at a relatively high price in 1993.

Lex, Page 14

Asset sales help IRI cut losses for year

By Robert Graham in Rome

IRI, the Italian state holding company, yesterday announced a sharp reduction in losses during 1994 both at the consolidated and group levels.

Consolidated losses were cut to L354bn (\$218.01m) from L10,209bn while group losses fell to L1,471bn from L10,230bn.

The difference between the two performances reflected the inclusion in the consolidated results of strong dividend returns from the Autostrada motorways division and IRI's 60 per cent ownership of Stet.

The group figures showed the effects of continued heavy financial charges.

The improved balance sheet was broadly in line with forecasts made last year by Professor Romano Prodi, the outgoing chairman, when he was making way for Mr Michele Tedeschi, his successor.

The overall result reflected an acceleration in asset sales during 1994. These divestments included IRI's stakes in Banca Commerciale Italiana, Cirio-Bertoli-De Rica, the agro-industrial group, and the special steel division of Ilva.

Delays in approval from the anti-trust commission prevented inclusion in the accounts of L590bn from the final tranche of SME, the food-stuffs holding of which CSRD had also formed part.

A management note also attributed the reduced losses to savings and rationalisation within the holding.

The combination of asset sales and rationalisation helped cut overheads and reduced debt.

Consolidated debt fell to L59,968bn from L70,321bn while group debt dropped marginally to L23,040bn from L24,098bn.

During the year group turnover reached L81,063bn against L79,786bn, roughly equivalent to 5 per cent of national gross domestic product.

Consolidated net assets increased 20 per cent to L30,019bn while during 1994 the group's capital was raised from L2,009bn to L6,364bn.

A change of culture for the Basque co-operatives

Spain's Mondragon group is looking to outside sources to fund its expansion, reports David White

Plans are due to be finalised within the next few weeks for channelling the first investments by Spanish and foreign institutions in Basque co-operatives at the heart of the Mondragon group, Spain's 12th largest business concern in terms of sales.

Mondragon Corporación Cooperativa, the central administration at the head of about 100 industrial, financial and commercial co-operatives, expects this month to decide on the purchase of a listed company which will act as vehicle for the participations.

The co-operatives, together with more orthodox subsidiaries and joint ventures outside Spain, form a near \$5bn-a-year group with 28,000 employees and interests as diverse as banking, bicycles, bridges, buses and dishwashers.

The move towards tapping the stock market for funds - a new departure in Mondragon's 40-year existence as an industrial organisation - comes after long and hesitant preparation. The group came to the conclusion four years ago that it needed more capital than it could generate internally. It began working on concrete plans in 1992, but these were delayed last year because of depressed market conditions.

Its approach is still ultra-cautious. "We have to see how well it goes down," says Mr Javier Mongelos, board chairman. "We know the white goods market and the auto components market, but not the capital markets."

The planned first step will involve relatively modest outside investments of Pta12bn (\$99m). Of this, Pta7bn will go into "special participations" in four co-operatives in the Basque region, all until now worker-owned: the Fagor domestic appliance company, Fagor Ederlan, a producer of auto components, Oruma, specialising in lifts, and Urra, a construction venture focusing on steel structures.

In addition, MCC is seeking a "reserve" of Pta5bn to go into new businesses, including joint ventures outside the worker-ownership structure.

Access to new capital has been made possible by a change in the Basque region's legal framework for co-operative ventures, of which Mondragon is a widely-admired pioneer. The participations will be non-voting, with dividends paid out of pre-tax profits.

Until now the group's only means for tapping external funds has been through borrowing, creating what Mr Mongelos describes as a competitive handicap.

The group plans to purchase an investment company from a current shortlist of three.

'We know the white goods market and the auto components market, but not the capital markets'

These include Ascorp, controlled up to now by Once, the Spanish blind people's organisation. A listed company is being sought in order to provide liquidity, and MCC has opted to buy an existing portfolio company rather than set up a new one, to gain a "back door" entry to the stock markets. Under Spanish stock exchange regulations a new company would not be eligible for listing until it had shown profits for two years.

Contacts with potential institutional investors are being handled through London-based MAP Securities.

The investment unit will be traded on the Madrid and Bilbao exchanges. MCC plans to retain a stake of about 10 to 12 per cent in the unit. A further 5 per cent will be made available at special conditions to members of the co-operatives, to help win them over to the scheme.

Says Mr Mongelos: "We have to be careful how we explain this. It's a new formula that could be badly interpreted."

The plan coincides with international expansion. In the

past three years the group has begun to function as a multinational, building up a series of manufacturing and retail operations outside Spain.

A new joint venture with a Moroccan partner at Mohammadia, near Casablanca, is set to make 80,000 refrigerators a year when in full production, and another joint project is under negotiation in Egypt. An agreement has been signed to supply washing machines in kit form to Iran, and a Chinese joint venture for luxury coaches has been established in Tianjin.

These are in addition to subsidiaries in Mexico and Thailand, and hypermarkets in southern France in partnership with the French Promodes group. The Spanish concern has also bought control of a French computer services company, SSI, in Bayonne.

"We are learning to live with two different cultures," says Mr José Ignacio Gárate, an MCC board member. The foreign units are not run according to co-operative precepts, and managers have to be hired at market rates, in contrast to those at MCC, whose salaries are often 30 to 40 per cent below what they might receive in other companies.

Recovering from an economic recession which led to a fall in the group's industrial turnover in 1993, MCC showed a 17 per cent growth in pre-tax profit last year to Pta33.7bn on sales of Pta486.9bn. Mr Mongelos forecasts a 12 per cent rise in earnings to about Pta38bn this year, with sales of close to Pta600bn, an increase of about 20 per cent. Exports are expected to increase 26.5 per cent to Pta100bn.

In the first four months, exports were 80 per cent up on the same period last year and Spanish sales by the group's industrial companies up 21 per cent. This growth is expected to lead to an increase of 2,400 in the total workforce. Its industrial units, which shed 1,400 employees between 1992 and 1994, are expected to add 1,100 new jobs this year.

TeleDanmark considered joint SPT bid

By Vincent Boland in Prague

TeleDanmark considered forming an alliance with a consortium of Czech banks to bid for a stake in SPT Telecom, the Czech Republic's state telephone company.

However, officials at the Danish operator confirmed yesterday that talks between the parties were subsequently called off, and TeleDanmark submitted a bid on its own.

Mr Hans Würtzen, chief executive of TeleDanmark, said an

alliance with the consortium, led by Komerční Banka, was one of a number of options explored to strengthen its chances of winning the 27 per cent stake, for which final bids were lodged last Friday. Talks were called off because of the difficulties of introducing a new partner into the bidding process at a late stage.

Mr Würtzen said TeleDanmark had lodged a "competitive and fair" bid for the stake, but declined to elaborate.

Dr Richard Salzmann, chairman of Komerční Banka, said

last month the bank was seeking a role in SPT's future through a possible alliance with one of the bidders.

The European Bank for Reconstruction and Development is also believed to have sought a role in the modernisation of the Czech company, which is set to begin a multi-billion dollar programme once the government selects its strategic partner.

Mr Würtzen said that if the bid succeeded, a representative of British Telecommunications, which is informally supporting

TeleDanmark's bid, would sit on a committee that will oversee the modernisation plan.

The Danish operator plans to make SPT an international telecoms hub and a preferred distributor for BT's Concert - a joint venture with MCI of the US which provides global telecoms services to companies - in the Czech Republic.

A steering committee overseeing the tender is currently evaluating the five bids. The government is expected to decide the winner by the end of this month.

Crédit Agricole 1994 Results

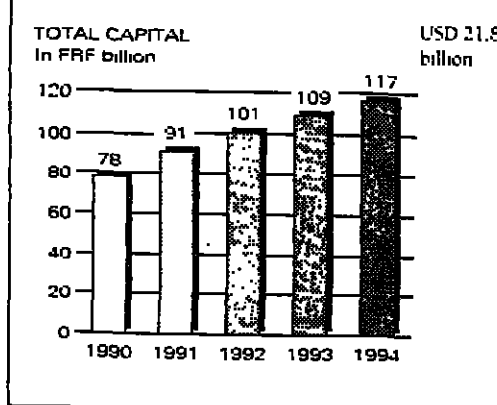
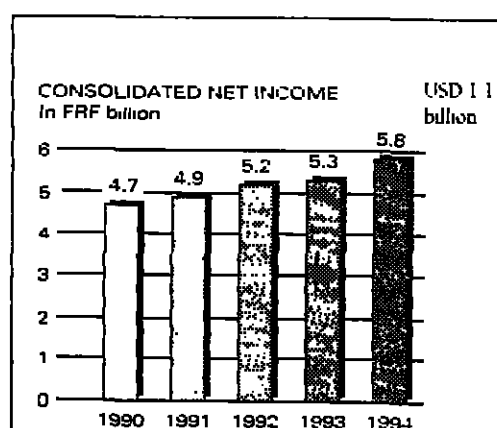
Higher earnings and strengthened capital base
Crédit Agricole consolidates its lead in the French banking industry

5.8 billion francs

of consolidated net income, up 8.5% from 1993, makes Crédit Agricole France's No.1 bank in terms of earnings.

116.6 billion francs

of total capital - nearly 80% of which is Tier One capital - confirms Crédit Agricole's solidity and its place among Europe's leading banks.

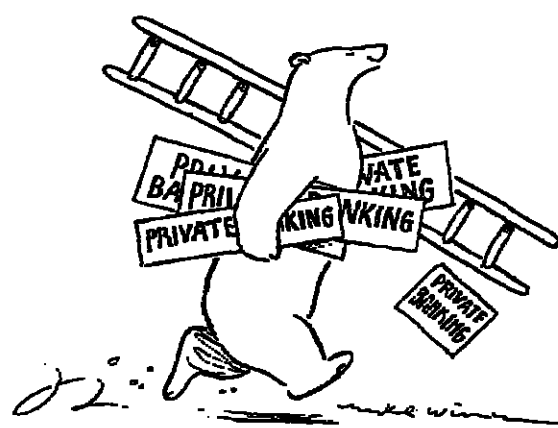


1,754 billion francs

of total consolidated assets, up 5.2% from 1993, illustrates Crédit Agricole's expanding franchise and growing market share.

10.2%

capital ratio, which has risen steadily over the past five years, gives Crédit Agricole broader scope for future growth.



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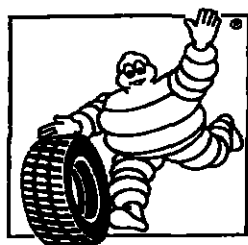
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May, 1995



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NOTICE TO HOLDERS OF FOUNDER WARRANTS

Holders of the 2,652,000 founder warrants to subscribe for shares in Eurotunnel P.L.C. and Eurotunnel S.A. issued in 1986 (the "Founder Warrants") are hereby notified that the period of exercise of the Founder Warrants will expire on 30 June 1995.

After 30 June 1995 any subscription rights that have not been exercised will lapse and warrant certificates will cease to be valid for any purpose.

By order of the Board
S A Walker FCIS
Secretary
Eurotunnel P.L.C.The Board of Directors
Eurotunnel S.A.
30 May 1995

Instituto de Crédito Oficial

US\$ 450,000,000

Statutory Guaranteed Floating Rate Notes due 1997

In accordance with the Terms and Conditions of the Notes, notice is hereby given that for the interest period from June 05, 1995 to December 05, 1995 the Notes will carry an interest rate of 6.05% per annum.

The Coupon Amount payable on the relevant Interest Payment Date, December 05, 1995 will be US\$ 307.54 per US\$ 10,000 principal amount of Note and US\$ 3,075.42 per US\$ 100,000 principal amount of Note.

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INTERNATIONAL COMPANIES AND FINANCE

Paper profits clear space for restructure

Enso-Veitsiluoto merger highlights concentration of Finnish forestry, says Hugh Carnegie

While newspapers winced at the recent rapid rise in paper prices, the rich flow of profits that the high prices are pumping into producers has provided the opportunity for some long-awaited restructuring in Finland, the world's second largest forestry sector exporter after Canada.

This month, the Finnish government gave the go-ahead for a merger of two of the country's top forestry products groups, Enso-Gutzeit and Veitsiluoto, both at present controlled by the state. Assuming it is approved by parliament, the merged company (yet to be named) will become not only the biggest in the sector in Finland, but also the third-largest in Europe after SCA and Stora, both of neighbouring Sweden.

The move confirmed a trend of the current upturn in the forestry industry cycle, of producers seeking to use their restored profitability to consolidate - rather than to add output capacity that could prove costly when the highly cyclical industry turns down again.

The Enso-Veitsiluoto merger follows the takeover earlier this year by SCA of the German group FWA, which allowed SCA to overtake Stora as Europe's biggest forestry products producer.

Enso and Veitsiluoto have announced that the merged company would spend Fm2.5bn (\$650m) on a new 380,000-tonne, fine-coated paper machine in Oulu in northern Finland, one of the biggest investments in

new paper capacity by Finnish groups to date in the present cycle.

But Mr Jari Kohler, head of the Finnish forest industries federation, said the investment was fully justified in the context of the merger of the two companies, which are strongest in fine papers and publication papers.

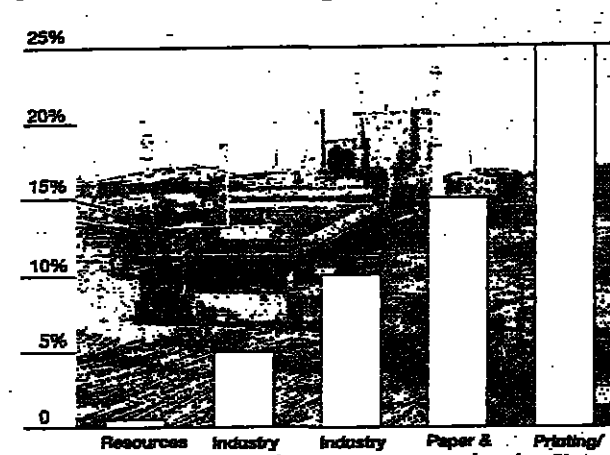
Mr Kohler described the merger as "a very good move. It will yield hundreds of millions of marks in savings," he said. By combining forces in what is a capital intensive industry, the two groups would be better equipped to withstand the inevitable downturn in the industry.

Enso-Veitsiluoto last year combined turnover of more than Fm3.0bn. This puts it ahead of United Paper Mills (owned by the Repola group) and Kymmene, the next largest Finnish group, and makes it comfortably larger than the fourth-placed competitor, Metsä-Serla.

The merger was foreshadowed by Enso's acquisition last year of a 35 per cent stake in Veitsiluoto, which it purchased from the government. One of the consequences of the merger will be a reduction in the state's holdings, which at present amount to controlling stakes in both companies.

The government has said it is prepared to relinquish even a minority stake in Veitsiluoto. But it is not yet clear whether the state will remain a major shareholder in the merged

Finland: the share of global market



group in the long term. In the meantime, the question is whether further restructuring is still to come within the Finnish industry. The merger with Veitsiluoto is the culmination of steady growth by Enso. Its turnover grew from Fm8.4bn in 1991 to Fm17.7bn last year, in part through large acquisitions of forestry operations from Ahlström and Tampella. Previously, the sector had seen the merger of Repola and UPM in 1991.

This restructuring has been part of a dramatic concentration of the industry over the past 25 years. Since 1970, total production of paper, paperboard and pulp by

Finnish companies has doubled to 22m tonnes a year. But in the same period, the share of the sector's turnover accounted for by the four biggest companies has risen from 33 per cent to 85 per cent.

Finnish companies, with 5 per cent of world forestry industry output, account for 10 per cent of global forestry industry exports. They are among the most efficient producers, leading the world in the average size of their paper and paperboard machines.

Like their Swedish rivals, Finnish companies are enjoying a surge in profits after a deep recession in the early 1990s.

Last year total profits in the Finnish industry reached

Fm8bn and are on course to reach Fm1bn this year, yielding a return on capital of 15 per cent.

But the industry has still not fully recovered its financial strength after the recession. Total net debt in the sector exceeded total turnover in 1992 and stood at more than 70 per cent of turnover last year. It is expected to fall to 54 per cent by the end of this year, but will still be short of target levels of 35 per cent to 40 per cent. Likewise, the industry's overall equity-to-assets ratio has improved since the recession to 40 per cent, but remains short of the 50 per cent optimum.

Against this background, the big producers may yet look to further restructuring to bolster themselves against the next downturn. Although the profits flow is expected to continue strongly through next year, Nordic forestry companies have already begun to see their share prices falter as the market anticipates the end of the present boom.

Last year, Kymmene and UPM were in talks on what would have been a spectacular merger, but broke off because of a disagreement on price. Metsä-Serla, the co-operative group that owns Metsä-Serla, had made plain its interest in some kind of link with Enso until stymied by the Enso-Veitsiluoto merger.

Mr Kohler does not rule out some further restructuring. "All options are open. I would not put it beyond doubt that something could happen."

NEWS IN BRIEF

Satelindo to list in New York

PT Satelit Palapa Indonesia (Satelindo), the country's rapidly-growing telecom group, has unveiled plans to list its shares on the New York and Jakarta stock exchanges, AP-DJ reports from Jakarta.

It also said yesterday that there would be no more share sales to foreign companies before the listings. "We plan to offer shares to the public in 1998 or 1999, depending on the internal and external conditions," Mr Iwa Sewaka, the group's president, said.

In April this year, DeTeMobil, a subsidiary of Germany's Deutsche Telekom, beat three other international bidders to buy a 25 per cent shareholding in Satelindo.

Blockbuster buys

Blockbuster Entertainment, the US home entertainment concern acquired by Viacom last year, has acquired 80 per cent of Grupo Mexicano de Video, its Mexican franchisee, for \$35m, AP-DJ reports from Mexico City.

Blockbuster said the Mexico franchisee operated 100 Blockbuster video stores, either alone or through regional joint ventures, and planned an aggressive development programme.

It said the investment would enable the Mexico franchisee to "take advantage of significant growth opportunities in the country".

China Steel up 79%

China Steel, the Taiwanese steel group, has posted a 79 per cent jump in pre-tax profit, to T\$1.83bn (US\$715m) for the year to May, AP-DJ reports from Taipei. This compares with the year-ago figure of T\$1.02bn.

The results were struck on revenues of T\$5.82bn, up 23 per cent on last year's T\$4.73bn.

China bank ahead

Bank of China has credited reforms of the country's foreign exchange system and improved management for pre-tax 1994 profits of Yn12bn (\$900m), up 23.5 per cent from 1993's result, the China Daily said, Renter reports from Beijing. The profits, the highest by a state-

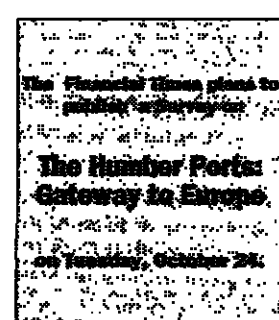
owned bank last year, were boosted by the abolition of the dual-track foreign exchange rate system on January 1 1994, which saw a steep devaluation in the yuan.

China's other big banks, which deal mainly in yuan, were weaker.

Placer Pacific bids

Australia's Placer Pacific said it had lodged a bid for Benguet's Kingkong copper and gold property in the Philippines, Renter reports from Melbourne.

"We are interested in the area and we have put in a tender. We expect an outcome within about two weeks," Placer said. It said Placer Pacific, about 75 per cent owned by Placer Dome of Canada, had bid for all of the property, estimated to contain 2.9m pounds of copper and 5.5m ounces of gold.



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Floating Rate Notes due 1996

Notice is hereby given that, in accordance with the provisions of the above mentioned Floating Rate Notes, the rate of interest for the six month period from June 6, 1995 to December 6, 1995 has been fixed at 6.525% per annum.

The interest payable on December 6, 1995 will be US \$3,316.88 in respect of each US \$100,000 Note.

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FT Surveys

INTERNATIONAL COMPANIES AND FINANCE

Brazil venture for European chemical groups

By Angus Foster
in São Paulo

European chemical companies Hoechst and Rhône-Poulenc are merging their South American polyester and nylon fibre businesses into a new company, Fairway Filamentos, to be headquartered in Brazil.

The two partners hope the merger will give them critical mass to face growing south-east Asian competition in markets such as Brazil. Independently, the two businesses are not profitable enough to warrant new investment and cope with increased demand, according to Mr Edson Vaz Musa, chairman of Rhône-Poulenc.

Fairway is forecast to have 1995 sales of \$400m, half of that from polyester fibres. The company intends to invest \$20m in the next two and a half years to increase capacity, update

technology and launch new products. Annual polyester capacity will be increased to 51,000 tonnes from 41,000 tonnes, and nylon capacity will rise by 10,000 tonnes to 50,000 tonnes.

About 3,100 people will be employed in four factories in São Paulo, with products aimed at the textile and industrial markets. The companies gave no details on job losses.

Brazil's textile companies have faced mounting pressure from imports since tariffs on the last year, and imported nylon and polyester threads have increased their market share from almost zero to between 15-20 per cent.

Mr Vaz Musa said the merger had been discussed for about a year and made sense because the two companies had different clients and product types.

Magna climbs 10% to C\$79.8m in term

By Robert Gibbons
in Montreal

A slow start-up of production of Chrysler's new minivan in the US and a lagging European market narrowed Magna International's third-quarter margins, but the upward trend in earnings trend continued.

The automotive components group said net profit for the three months to April 30 rose 10 per cent to C\$79.8m (US\$57m), or C\$1.80 a share, from C\$72.4m, or C\$1.18, a year earlier, on revenues of C\$1.23bn against C\$1.1bn.

Profit for the first nine months rose 35 per cent to C\$244m, or C\$3.90 a share, from C\$169.2m, or C\$2.62, on revenues of C\$3.57bn against C\$2.5bn.

Magna said the gains were due partly to greater penetra-

tion of the North American parts market, improved income from subsidiaries, lower interest cost and lower taxes.

US carmaker Chrysler's minivan output was speeding up and Magna's margins should improve. Magna supplies C\$1.4m worth of parts to each new minivan.

Magna said it expected its European operations, which account for about C\$1bn of annual revenues, would become more profitable as the recession eased, but warned that European margins were traditionally lower than those in North America.

PanCanadian Petroleum, the energy arm of Canadian Pacific, has bought 75 per cent of US gas marketer National Gas & Electric to gain more control in marketing its natural gas to US customers.

Seven of the nine firms sued by West Virginia settled out of court, but Morgan Stanley and Chase Securities contested the suit.

The Chase Securities case has been pending awaiting the Morgan Stanley ruling.

Doubt hangs over top MCA job

By Tony Jackson in New York

The issue of management succession at MCA, the Hollywood studio owned by Seagram, the Canadian drinks group, was in further doubt yesterday with the apparent withdrawal of two rumored candidates for the top job.

Mr Terry Semel, chairman of rival studio Warner Bros, said in a statement that he looked forward to "yet another record-breaking year" with his present company. Meanwhile, talks between Seagram and Mr Michael Ovitz, head of Hollywood's Creative Artists Agency, were reported to have broken down.

Seagram would not comment on the rumours.

It also disclosed sales and cash flow figures for MCA. Total sales last year were \$4.8bn, up 16 per cent on 1993. Earnings before interest, tax, depreciation and amortisation were \$533m, up 20 per cent.

Sales in 1994 from films were \$2,728m (\$2,200m), from music \$1,249m (\$1,081m), from recreation services \$245m (\$213m) and from book publishing \$278m (\$245m). Cash flow from films was \$118m (\$160m), from music \$199m (\$151m), from recreation services \$70m (\$95m) and from book publishing \$32m (\$34m).

Reaping the rewards of tough restructuring

US producers of farm machinery are on course for a bumper year, writes Laurie Morse

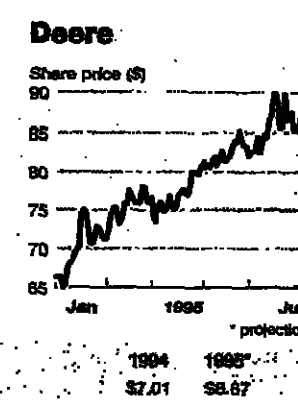
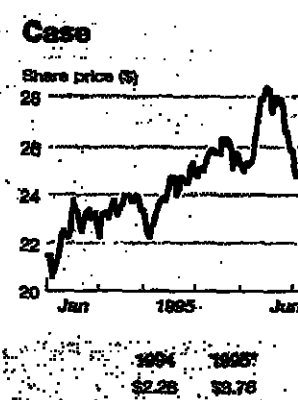
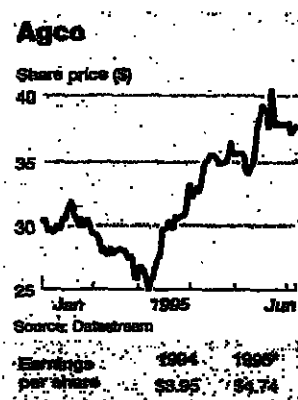
The US farm machinery industry is enjoying one of its strongest years, helped by a robust domestic farm economy and efficiencies gained from five years of tough corporate re-engineering. After staggering through the farm recession of the early 1980s, surviving farm equipment makers have slimmed their workforces and reined in their inventories.

The outlook for the equipment companies is decidedly bullish. Farmers have experienced three consecutive years of relatively high cash incomes, and US farm exports are projected to reach record levels this year. Last year's bumper harvest of maize - the US's largest cash crop - has moved to the market rapidly, in part because China, once a net exporter, turned net importer this year.

Although wet weather has delayed this year's spring plantings, agronomists are still looking forward to a healthy, albeit not a record, harvest.

That should be enough to sustain farm incomes through 1996. This year, US agricultural exports will exceed \$5bn, up from \$4.5bn a year ago.

The US Department of Agriculture expects US net cash income to farmers - a combination of government payments and market receipts - to



be in the range of \$50bn to \$55bn, about the same as 1994, but down from 1993's record \$58.5bn.

The result has been a 7 per cent rise in demand for tractors, combines and harvesters, the type of big purchases that farm managers often delay if they suspect a lean year is in the offing. Prices received for the machines are also rising.

Although price gains of about 3 per cent a year in the past two years have tracked inflation, they are a vast improvement over a decade of discounted price declines.

The three leading US equipment makers - Deere, Case, and Agco - are reaping the benefits. Unlike the fragmented European agricultural

machinery industry, the three companies control 90 per cent of the \$5.2bn US farm equipment industry.

Deere, with its signature green tractors, has long dominated the US farm market. Known for high-quality management and good labour relations, Deere has seen sales rise 18 per cent to \$4.9bn in the first half of this year, while income jumped 35 per cent to \$373.3m. Wall Street analysts expect Deere to earn nearly \$9 a share this year, up from \$7 in 1994.

Although Deere also makes construction equipment and lawn and garden machinery, about 60 per cent of its sales are farm-related.

The company's farm equip-

ment prospects have brightened considerably since Case began rationalising inventories and abandoned a strategy of heavy price discounting to gain market share.

The \$1.4bn restructuring at Case over the last three years was a prelude to its parent company Tenneco spinning off a majority of Case's shares to the public.

Although the decision to end discounts disappointed farmers and cut Case's market share, profits rose dramatically as inventories came under control.

Mr Tobias Levkovich, a Smith Barney analyst, says the Case reforms "have clearly

helped the whole industry".

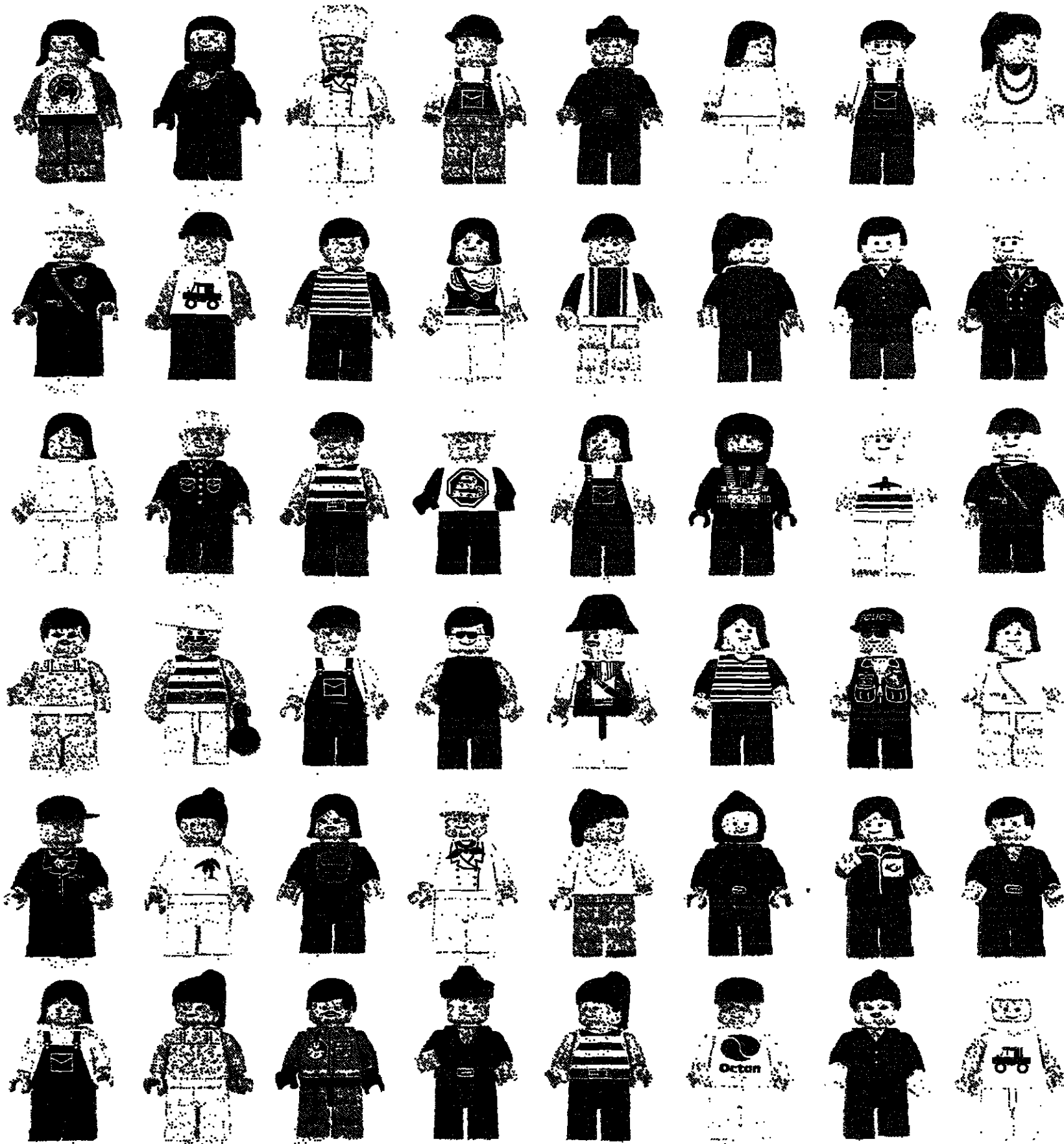
Deere has also brought its troublesome overseas operations under control, reducing offshore employment to 7,700 last year from 10,000 in 1990. It has cut overheads by outsourcing European tractor production from Renault and Zetor.

Case is perhaps in the strongest position to compete in the farm equipment sector, regardless of cyclical downturns. The company has cut worldwide employment to 17,000 from 33,000 in 1989. By 1997, Case expects to have only 9 factories worldwide, compared with the current 15, and 10,300 employees, as well as a re-tooled product line.

Agco, a four-year-old upstart that has grown by acquiring time-worn machinery brands and outsourcing production to keep overheads down, has seen earnings double over the last year.

In the long term, the challenge facing the leading US farm machinery producers is how to carve profits out of an industry with a flat growth curve.

The 1995 farm legislation being crafted in Washington is expected to encourage farm consolidation in the Midwest, leading to a smaller, but financially more stable market for these companies.



SPOT THE REFUGEE

There he is. Fourth row, second from the left. The one with the moustache. Obvious really.

Maybe not. The unsavoury-looking character you're looking at is more likely to be your average neighbourhood slob with a grubby vest and a weekend's stubble on his chin.

And the real refugee could just as easily be the clean-cut fellow on his left. You see, refugees are just like you and me.

Except for one thing.

Everything they once had has been left behind. Home, family, possessions, all gone. They have nothing.

And nothing is all they'll ever have unless we all extend a helping hand.

We know you can't give them back the things that others have taken away.



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United Nations High Commissioner for Refugees

We're not even asking for money (though every cent certainly helps).

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CONTRACTS & TENDERS

GOVERNO DO ESTADO DO PARANÁ

COMPANHIA PARANAENSE DE ENERGIA - COPEL
SAL TO CAXIAS HYDROELECTRIC PROJECT
IGUAÇU RIVER

INTERNATIONAL BIDDING C-220
NON DESTRUCTIVE TESTINGS
CALL FOR BIDS

COMPANHIA PARANAENSE DE ENERGIA - COPEL, informs that an international bidding is open for supply of radiographic testing services, ultrasonic testing services for field weldings, supply of ultrasonic equipment and training courses for the Salto Caxias Powerplant, located at Capão Leão, Paraná and Nova Friburgo, Rio de Janeiro, in the State of Paraná - Brazil.

This lowest price type international bidding is open solely to individual companies. The amount of costs related to this supply will be covered by COPEL's own resources. COPEL is asking for a credit line for Salto Caxias Powerplant from Inter-American Development Bank - IDB, which if allowed, will cover this supply.

The Bid Documents will be available to bidders from June 01, 1995 to July 03, 1995, against payment in Brazilian currency of R\$ 70,00 (seventy Reals), at the following addresses:

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Rua Voluntários da Pátria, 233 - 5º andar - sala 504
80020-000 - Curitiba - PR
Telefone (55-41) 332-1212 - Ramal 5541
Telex (55-41) 331-3265

or
Execução COPEL / São Paulo
Alameda Santos, 1800 - 14º andar - conj. 14B
04163-200 - São Paulo - SP
Telefone (55-11) 289 1431

At the time of Bid Documents purchase, all companies shall present a letter containing their complete mailing address.

The receipt of Pre-qualification and Bid Documents is scheduled for August 03, 1995, at 2:00 PM, at COPEL's office meeting room, in Curitiba, 233 Voluntários da Pátria Street, 5th floor.

The Bidding will be ruled by Law nº 8666, dated June 21, 1993, and by other conditions stated herein and in the Contract Documents.

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INTERNATIONAL COMPANIES AND FINANCE

Thai group bids for Standard Chartered unit

By Ted Bardecke in Bangkok

Management at Standard Chartered Securities Asia, the loss-making Asian brokerage arm of Standard Chartered, the UK-based bank, holds the key to a successful conclusion to talks aimed at selling the securities company to a Thai group, according to a source close to the negotiations.

The Thai group, led by Thai Military Bank and Nava Finance and Securities, a large bank and a mid-sized securities company respectively, have made a bid to take over Standard Chartered Securities Asia, which Standard Chartered has been attempting to sell for some time. Terms have not been disclosed.

Earlier, Standard Chartered said that "it continues to be in discussion with a number of parties, none of which is presently on an exclusive basis".

The bank said "an immediate conclusion to any of these discussions is not anticipated". Sources say the Thai bid

involves giving the current management at Standard Chartered Securities Asia a stake of as much as 30 per cent in the company.

Standard Chartered would retain a minority position. The large management component of the bid means that management has to decide whether being owned by a Thai company, which because of Thai law would prohibit some international underwriting business, would be too much of an obstacle to returning the company to profitability.

In addition, the willingness of management to take a stake in the company has led Standard Chartered to review previous offers to purchase the Asian brokerage to see if one of these offers, with an additional management component, would be more attractive, according to the sources.

Standard Chartered Securities Asia has offices in Thailand, Singapore, Hong Kong, Indonesia and Malaysia.

South Korean bedrock fears free-market cracks

Posco's central economic role is set to keep it from reform in the short term, writes Peter Montagnon

There could scarcely be a better advertisement for South Korea's traditional interventionist industrial policy than Pohang Iron and Steel (Posco).

The company's position as a supplier of steel to Korea's important automotive and shipbuilding industries made it the bedrock of the country's economic success; and, in spite of continuing government influence over its affairs, it has also attained world pre-eminence. Once its present expansion plan is completed, in 1998, it expects to overtake Nippon Steel to become the world's largest steelmaker.

Equally, however, the debate on privatisation, which has been rumbling on since the election of reform-minded President Kim Young-sam in 1993, is a clear illustration of Korea's current policy dilemma.

Though the Kim administration espouses free market policies and economic "globalisation" in principle, it is reluctant in practice to move away from the industrial planning which has brought the

country so much success. In spite of occasional scare stories in the local press, the government is in no hurry to sell its remaining 35 per cent stake in Posco. A study on privatisation, commissioned by the government from the liberal-inclined Korea Development Institute, was due in April but has been delayed. In an attempt to pre-empt the outcome, Mr Hon Jae-yoon, deputy prime minister, said recently that privatisation was no longer an issue.

To devotees of pure competition policy, there are plenty of reasons why Posco should be fully privatised. It has a 74 per cent share of the domestic steel market. In price terms, it has not been able to exploit this position. Government influence over domestic steel prices has kept them below international levels, except for a couple of short periods during the 1980s.

But economists say monopoly practices have been evident in other ways - for example, in delivery schedules, where customers sometimes complain that they have been disadvantaged by Posco's tight delivery policy.

It would be in keeping with President Kim's globalisation ideals to privatise the company and introduce some competition to the market, which would help keep prices down. This could be done, for example, by splitting the company and putting its two plants at Pohang and Kwangyang in the south of the country into the hands of different owners.

Hyundai, Korea's largest car-maker, has also expressed an interest in entering the steel market. But the government remains hesitant, partly - say analysts - because it is worried about loss of control of such an important industry. It also reflects management opposition to the idea of break-up. "A human being stands on two legs. If you lose one leg, you can only hop," says Mr Shim Chae-kang, Posco senior managing director. "Unless you have two legs, you can't run - and that means you are dead."

It is not as if a combination of government control and monopoly has made Posco



Kim Young-sam: the Korean president faces policy dilemma

flabby. Posco has a history of strong and efficient management. Rigorous inventory control helps boost margins. Thanks to careful matching of supply and demand, capacity use is high. Last year, when net income rose 30 per cent to Won383bn (\$503m), it was 106 per cent of rated capacity. Posco is also financially strong. Gearing of about 100 per cent is low by Korean stan-

dards. Though the company has high debts in yen, it has been a net beneficiary of the appreciation of the Japanese currency. S.G. Warburg, the UK investment bank, calculates that yen receipts from exports outweigh yen expenditures on debt service and capital equipment by about Y70bn (\$527m) a year.

It can therefore easily afford the expansion plan, which will raise its capacity by 8m tonnes to 28m. Last week the company announced that half this extra capacity would be supplied by a new Won2,000m blast furnace at its Kwangyang plant. The furnace, which will be incorporated with existing sintering and coking plants, will involve state-of-the-art technology, making it one of the most advanced in the world.

There is no conflict between government and the company on the present expansion. But some analysts believe the relationship could become more fraught as Posco seeks to secure its medium-term future by overseas expansion and diversification.

Already listed in New York, the company plans listings in London this year and Hong Kong in 1996. It has a joint venture with USX in the US and is building a presence in

China and Vietnam, countries which, Mr Shin says, have strong and rising domestic demand for steel. Within Korea, it is diversifying into electronics and telecommunications, creating another source of growth against the time when the steel market matures.

Separately, Korea's eventual membership of the OECD may result in pressure to reduce the gap, now about 30 per cent, between domestic and international prices.

Korea may initially resolve this by lowering export prices rather than increasing domestic ones, says Mr J.C. Kim of RZW, but analysts believe the cosy relationship with government will start to look out of place as the company becomes increasingly multinational and as the Korean economy opens up.

But among his few statements since his appointment last year, Posco's new chairman, Mr Kim Mahn-je, formerly a senior economic planner, has said Posco should not engage in harmful competition and should help other industries through low pricing and extended credit terms. For the time being, Posco's place in the Korean economy is too important for it to be left alone.

Inco set to sell its mining equipment arm to Drillex

Inco, the world's second-biggest nickel producer, is in talks to sell its mining equipment operations to Sudbury-based Drillex International of Canada, Reuter reports from Toronto.

Inco said the sale, set for later this month, was expected to have no significant effect on its financial position.

The deal would include Continuous Mining Systems and

all its operating units except CMS Chile, Inco said.

According to Inco's annual report, CMS sales totalled US\$37m in 1994 and it incurred an operating loss of US\$4m, compared with an operating loss of US\$2m in 1993.

Inco said Drillex was expected to use the acquisition to expand its range of services and products in Canada and abroad.

By Tony Walker in Beijing

Mr John Prescott, managing director of BHP, the Australian industrial conglomerate, has targeted China for expansion in fields ranging from power plant construction to gold mining under plans to globalise further its activities.

Australia's largest company is poised to make a multi-billion dollar commitment to China beyond existing investments, which include a steel rolling mill in Shanghai and another

in Guangdong. "BHP continues to go where opportunities are, anywhere in the world. We must diversify further," Mr Prescott said in Beijing. "But we don't want to be speculators, we want to be responsible risk-takers."

BHP's most ambitious project is a proposed \$3bn, 2,400MW power plant and adjoining coal mine at Haerwusu in Inner Mongolia, 300 km west of Beijing. The company yesterday submitted a letter of intent to the ministry of coal industry in the hope that the project will be included in China's

ninth five-year plan, beginning next year. Inclusion is a pre-requisite for such a venture going ahead. BHP equity in the venture would amount to about \$1.5bn, and return on investment would come both from the sale of electricity and export of high-quality steaming coal.

BHP is also bidding for a gold deposit at Lannigou in Guizhou province, south-west China, in competition with Newmont Mining of the US. The deposit is relatively small, at 40-50 tonnes of gold, but miners are show-

ing keen interest because it would be the first large foreign involvement in the gold sector under new regulations. Gold mining was closed to foreigners until recently.

China has offered 10 low-grade deposits to foreign companies. BHP geologists believe the Guizhou deposit is the most prospective, and Mr Prescott said the company would be prepared to spend "significant" sums developing it. BHP is assessing a lead-zinc deposit in Sichuan province, south-west

China. The company also has a stake in China's beer industry through its 38 per cent interest in Foster's, the Australian brewing group, which has established joint ventures in Guangdong province, Shanghai and in the northern city of Tianjin.

However, BHP is scaling down its involvement in oil exploration - having drilled 24 dry wells and spent \$100m. But it plans to become more involved in downstream activities, and stepping up the marketing of mineral and energy products.

BHP targets China as part of strategy to globalise activities

All of these securities having been sold, this announcement appears as a matter of record only.

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June 1995

COMPANY NEWS: UK

Seeboard to make price cuts

By Michael Smith

Seeboard, power distributor in the south-east of England, yesterday became the first regional electricity company since privatisation four years ago to implement price cuts which had not been imposed through the regulatory regime.

It said it would allocate two thirds of £20m a year in unforeseen cost savings to cutting prices. Most of the £20m will come through a cut in October of standing charges for domestic customers who will as a result, see their annual bills fall by about 28 or 3 per cent on average.

The company also said it expected to provide customers with a one-off rebate of 25p each if the National Grid, owned by the regional electricity companies, is damaged as planned later this year.

Seeboard said £10m a year of the £20m cost savings would be spent on increasing dividends. Decisions on the 1995-6 dividend would be made later "but if the additional

resources had been applied for 1994-5, the dividend for that year would have totalled 18.5p, an additional 4p per share."

Seeboard's statement follows intense criticism of the level of utility profits and rewards for shareholders. It accompanied full year results for 1994-5 showing an 8 per cent increase in pre-tax profits to £142m and a 24 per cent rise in dividends.

Seeboard's voluntary price cut follows decisions by fellow utilities Anglia Water and North West Water to provide customer rebates of 25p and 25.50p respectively. It comes just weeks ahead of an expected announcement early next month by Prof Stephen Littlechild, industry regulator, of a tightening of price caps agreed last August with the regional electricity companies.

Analysts were speculating yesterday that Seeboard may have volunteered more than the regulator had been considering. Some said Seeboard's announcement would increase pressure on Prof Little-

child to impose a tough regime.

Mr Jack Cunningham, Labour trade spokesman, welcomed Seeboard's announcement, but said there was a growing recognition that the present system of utility regulation was inadequate.

Seeboard said its proposed cut in the standing charge, which will cut final bills to domestic customers by 3 per cent on an annualised basis, was equivalent to cutting distribution prices next April by 11 per cent. Distribution prices make up a quarter of final bills.

Alternatively, Seeboard said its move equated to Prof Littlechild tightening the regulatory formula so that distribution prices could rise by only inflation minus 5 per cent for the four years from next April.

Seeboard is the first of the regional electricity companies in England and Wales to announce preliminary results. However the City expects most companies to wait until after they see the regulator's conclusions before cutting prices.

C&W directors' pay cut

By Alan Gane

The failure of Cable & Wireless, the UK based telecommunications company, to achieve performance targets has resulted in a cut in the remuneration packages of the company's executive directors.

Each executive director's package of salary, allowances and benefits has been cut by about one third. Lord Young, the group's chairman saw his remuneration fall from £777,163 to £479,247, while James Ross, chief executive was paid £391,275 compared with £578,100 the year before.

The salary changes are shown in detail in the annual report published this week.

Mr Michael Harris, formerly chairman of C&W subsidiary Mercury Communications, who left the group at the end of last month was paid £289,894, down from £395,426. He received compensation of £313,667, the equivalent of one year's salary and benefits on his departure.

Thames Water rules out paying one-off dividends

By Peggy Hollinger

Thames Water struck out at the trend by fellow utilities North West Water and Anglian Water, declaring it would not be drawn into making special payments to customers or shareholders.

The company, which also announced a sharp rise in annual profits, claimed the practice of making special one-off payments could jeopardise the basis of the current regulatory regime in the UK.

Mr Mike Hoffman, chief executive, said there was a danger that "in the current political environment, the value of medium-term incentive regulation could be lost".

Under present regulation, customers are rewarded through improved quality and increasingly tight price limits. "Given the medium-term nature of regulation, we think it is entirely appropriate that the benefits of outperformance go to shareholders," said Mr Hoffman.



Mike Hoffman: outperformance goes to shareholders

His comments came as Thames accompanied a 26 per cent increase in pre-tax profits to £204m with a higher than expected 15 per cent rise in the final dividend to 17.1p. The total payout to shareholders was 12.4 per cent higher at 25.3p.

Thames expected to be able to maintain dividend increases at roughly these levels, if its

performance in the first five years of privatisation was maintained.

The company said it made savings of £300m on its capital spending programme since 1989.

The Labour party attacked the company's profit performance, claiming it highlighted the need for greater consumer protection in privatised monopoly industries.

"The balance between the interests of shareholders, directors and those of consumers has been completely lost," said Mr Jack Cunningham, shadow secretary for trade and industry.

Privatised utilities have come under heavy fire recently over the level of profits and payments to shareholders and directors.

Thames's attempt to rule out special dividends before the next general election, in favour of what it hopes will be steady dividend growth, was not welcomed by the market.

The shares closed 8p down on the day at 500p.

Amersham's 9% rise disappoints

By Motoko Rich

Shares in Amersham International, the health science group, fell 11p to 894p yesterday as analysts reacted to results at the lower end of expectations.

Pre-tax profits rose 9 per cent to £47.2m (£43.5m) in the year to March 31, but were restrained by difficult conditions in Europe and restructuring costs in the industrial business division.

Turnover rose 2.9 per cent to £238.6 (£234.2m), with Life Sciences, the group's largest division, improving in the second half.

Mr Kirk Stephenson, finance director, said the market in Europe remained "challenging" because of public sector spending squeezes, consolidation in the pharmaceutical sector and depressed research budgets.

Operating profits in the Life Sciences division grew 7.1 per cent to £23.4m.

Operating profits in the

healthcare division grew strongly to £13.7m (£9.4m), reflecting a greater contribution from Metastrom, the group's pain-killer for cancer, and Myoview, used for imaging the heart.

Cerotec, the group's brain imaging product, met competition for the first time from Merck Dugon's Neurologix. Sales of Cerotec declined 11 per cent but Mr Bill Costell, chief executive, said developments would help the company expand its market share.

A £3.5m restructuring charge was composed mainly of reorganisation in the industrial quality and safety assurance business.

Mr Stephenson said the division's performance was disappointing in the first half, leading to a fall in operating profits to £5.2m (£6.7m).

Earnings per share rose 8 per cent to 50.6p (47p).

The board recommended a final dividend of 12.1p, giving 17p for the year, up 10 per cent from last time.

Lottery operator turns in £10.8m

By Raymond Snoddy

Camelot, operator of the UK's National Lottery, yesterday said it plans to become the world's most efficient lottery in terms of operating costs and returns to Government.

The operator of the lottery, which was launched last November, returned pre-tax profits of £10.8m for the year to the end of March.

Although the result was lower than many expectations, Camelot said the National Lottery had performed well ahead of forecasts and that greater efficiency could be achieved. Sales had been 30 per cent higher than forecast and the National Lottery routinely had weekly revenues of between £100m and £110m including the weekly on-line game and scratch cards.

"The launch of the National Lottery has been a remarkable success story," Sir George Russell, the chairman said.

The Camelot consortium is made up of Cadbury Schwe-

pes, De La Rue the security printers, GTECH UK, the lottery equipment company, Racal Electronics and ICL, the computer group.

Sales in the 20 weeks to March totalled £1.2bn. Some £317m - £90m more than forecast - went to the arts, charities, the millennium fund, the national heritage and sports.

Profit after tax totalled £5.3m which was 0.5 per cent of total revenues. Over the seven years of its licence Camelot expected net profit to remain under 1 per cent of revenues.

By the end of March, Camelot said it had created one of the world's largest lotteries.

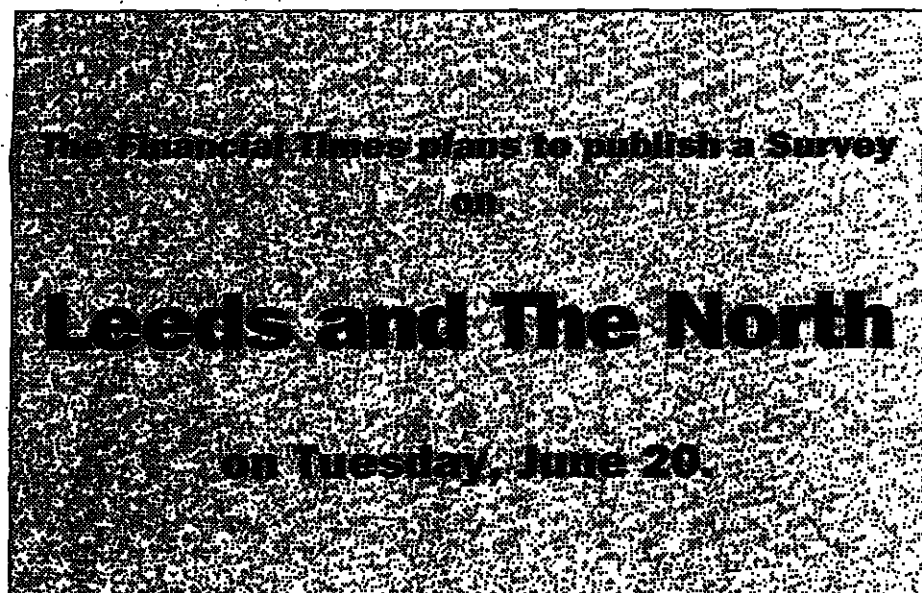
The consortium had invested £50m in equity backed up by £130m in guarantees but had decided to write-off £30m in start up costs in the first year.

Mr Tim Holley, Camelot's chief executive, was paid an annual salary of £240,000 in the year to March, a performance-related bonus of £120,000 plus pension contributions of £112,000.

RESULTS

		Turnover (£m)	Pre-tax profit (£m)	EPS (p)	Current payment (p)	Date of payment	Dividends Corresponding dividend	Total for year	Total last year
Allen	Yr to Mar 31	154.6	(126.3)	8.64	(7.04)	14.64	(12.11)	4.2	5.3
Allied Colloids	Yr to Apr 1	356	(326.5)	50.3	(45.9)	7.09	(6.23)	2.05	1.89
Amersham Int'l	Yr to Mar 31	333.6	(324.2)	47.3	(43.5)	50.6	(47)	12.1	11.1
Anglia	Yr to Apr 1	183.3	(178.7)	21.1	(25.1)	18.8	(18.3)	6.2	10.3
Anglo Metals	6 mths to Mar 31	26.9	(15.2)	1.31	(1.23)	3.4	(2)	1.3	1.2
Ascom Holdings	Yr to Mar 31	47.5	(77.9)	51.8	(6.88)	496.7	(206.3)	nil	nil
Black Leisure	Yr to Feb 28	65.6	(60.3)	0.61	(0.93)	1.82	(2.4)	1.5	2.25
Canterbury	Yr to Mar 31	8.89	(8.12)	3.57	(2.71)	7.9	(6.5)	2.2	3.25
CPI Access	Yr to Mar 31	21.2	(17.3)	2.04	(1.44)	14	(11.3)	2.5	3.7
De La Rue	Yr to Mar 31	747.1	(592.7)	146.6	(129.8)	55.1	(49.9)	16	23
Darby Group	Yr to Feb 28	16.4	(14.6)	1	(0.71)	5.14	(4.17)	1	1.9
European Colour	Yr to Mar 31	17.5	(15.6)	1.87	(1.22)	3.8	(2.48)	1.125	0.8
Mayer Int	Yr to Mar 31	1,305	(1,195)	51.5	(41.5)	28.4	(24)	7.3	11.5
MSL	Yr to Mar 31	123.3	(119.9)	6.05	(2.19)	11.21	(9.9)	4	nil
Powergen	Yr to Mar 31	186.6	(122.5)	29	(24.6)	25	(22.4)	5.9	6.1
Racal	Yr to Mar 31	980.2	(916.1)	58.3	(28.4)	13.65	(6.47)	3.25	2.75
Seeboard	Yr to Mar 31	1,196	(1,218)	142.4	(131.7)	41.5	(37.8)	10.3	8.46
Sherrill Holdings	6 mths to Mar 31	10.7	(8.08)	1.55	(1.2)	10.9	(7.4)	2.25	1.75
Starley Inds	Yr to Apr 1	342.2	(338.9)	20.2	(8.6)	13.8	(3.4)	6.2	8.5
Investment Trusts		NAV	Attributable Shareings (£m)	EPS (p)	Current payment (p)	Date of payment	Corresponding dividend	Total for year	Total last year
Edinburgh Income	Yr to Apr 30	30.8	(30.7)	0.617	(0.688)	4.11	(4.59)	1	4
Edinburgh New Tiger	6 mths to Apr 30	30.83	(45.28)	0.605	(0.944)	0.216	(0.337)	1	4
Sherrill Sheredd Int	Yr to Apr 30	71.1	(68.6)	3.73	(1.85)	9.91	(8.85)	2.4	9.6

Dividends shown net. Figures in brackets are for corresponding period. *On increased capital. *SUSM stock. *Adjusted for scrip issue. □ Comparatives are for 27 wks to April 30 1994. *Already announced. *Exceptional credit. *Exceptional debit.



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To mark this event the FT will be publishing a special survey. This will focus specifically on Leeds and its position as the principal business centre of a region stretching north from Yorkshire through to the Scottish border.

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FT Surveys

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Issuer	ISIN	Issued Amount US\$ million	Maturity	Issuer	ISIN	Issued Amount US\$ million	Maturity
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Abdij National First Capital BV	XS0042950103	100.00	Apr 2003	Finnish Export Credit Limited	XS0039728448	100.00	Oct 2002
ABN AMRO Bank NV	XS0039245302	150.00	Aug 2002	International Bank for Reconstruction & Development	XS0042532647	100.00	Mar 1998
Auxiliaire de Crédit Foncier de France	XS0039479368	300.00	Sept 2002	Internationale Nederlanden Bank NV	XS0039355234	200.00	Sept 2002
Auxiliaire de Crédit Foncier de France	XS0041958504	100.00	Feb 2003	Internationale Nederlanden Bank NV	XS0043723104	100.00	May 2003
Banco Nacional del Lavoro SPA (H.K.)	XS0046054622	225.00	Oct 2003	Internationale Nederlanden Bank NV	XS0046250212	300.00	Oct 2005
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Banque Nationale de Paris	XS0039964092	225.00	Oct 2002	Landesbank Rheinland-Pfalz Girozentrale	XS0047878979	100.00	Dec 2005
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Bayerische Landesbank Girozentrale	XS0043352284	150.00	May 2003	LKB Baden-Wuerttemberg	XS0039978639	200.00	Oct 2002
Bayerische Vereinsbank AG	XS0039265326	350.00	Aug 2002	LKB Baden-Wuerttemberg	XS0041626846	200.00	Feb 2003
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Creditanstalt-Bankverein	XS0042924489	250.00	Apr 2003	Swedish National Housing Finance Corporation	XS0039751267	100.00	Oct 2002
Creditanstalt-Bankverein	XS0045130530	100.00	Aug 2005	Toronto Dominion Bank	XS0039719454	150.00	Oct 2002
Crédit Local de France	XS0039170880	200.00	Aug 2002	Toyota Motor Credit Corporation	XS0042938869	100.00	Oct 2000
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Crédit Local de France	XS0043612026	100.00	May 2003	Z-Laenderbank Bank Austria AG	XS0039260798	250.00	Aug 2002
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COMPANY NEWS: UK

De La Rue climbs to £147m

By Christopher Price

De La Rue, the security printer, specialist paper and banknote group, yesterday reported a 13 per cent increase in pre-tax profits from £129.8m to £146.8m for the year ended March 31, 1995.

The results came in line with market expectations following a profits warning in March when the group had indicated the likely profits level. However, De La Rue's forecast of only "modest earnings growth" in the current year disappointed the market and the shares fell 14p to 913p.

Turnover rose 26 per cent from £592.7m to £747.1m, which included a £7.2m contribution from Portals, the specialist paper group purchased in December for £66m. Earnings per share advanced 10 per cent to 55.1p (49.9p). The recommended final dividend of 16p makes a total of 23p (20p).

Profits at Garry, the German security equipment manufac-



Jeremy Marshall (left) with Les Cullen, finance director

turer, halved to £5m - signalled at the March profits warning - on turnover of £122m. Mr Jeremy Marshall, chief executive, said that Garry's order book had improved significantly in recent weeks, although trading conditions remained competitive.

The subsidiary's problems

£1.1m of profits on £7.3m of sales for the last eight weeks of the financial year. Mr Marshall said that the benefits of the acquisition, which was mildly dilutive on earnings, would show through strongly in the current year's results.

The disposal of non-core businesses from the Portals group was continuing and De La Rue expected to make £160m from the eventual sales. Since the March year-end, Houseman, Portals Engineering and Technology have been sold for £49.7m.

The Transactions Systems business posted a 78 per cent profit rise to £8.9m, while the group's share of profits from Camelot, the National Lottery operator, amounted to £2.4m.

Mr Marshall said current orders in the banknote business were good, although not at the record levels of recent years. However, the performance of Payment Systems would depend on whether Garry's recovery is sustained.

Virgin may raise MGM bid

By Patrick Harverson

Virgin, the leisure group, is believed to be ready to raise its offer for MGM Cinemas, the cinema chain which is being auctioned by Crédit Lyonnais, the state-controlled French bank.

Virgin would not comment on the announcement from the government yesterday that a rival bid by media group Carlton Communications would not be referred to the Monopolies and Mergers Commission. However, a source said Virgin was considering making a last-minute change to its offer having persuaded a partner to join its bid.

Virgin and Carlton are among at least three groups competing to buy MGM Cinemas, the UK's largest chain. Bank Organisation, the leisure group which owns the Odeon chain of cinemas, has also put in an offer. However, if it succeeds, analysts believe the group would have to divest some of its cinemas to earn approval from the MMC.

Yesterday S.G. Warburg, the merchant bank handling the sale of MGM Cinemas for Crédit Lyonnais, said no decision had been made and the auction was "proceeding as normal." The bank added that Crédit Lyonnais was standing by its original statement that it would like to conclude the auction by the end of June.

Details of the various offers remain sketchy, but Bank is understood to have tabled a £190m-plus bid, while Carlton's offer is thought to be of a similar size. The Virgin bid is believed to be the smallest of the three.

Select purchase

Select Appointments (Holdings) has acquired 82 per cent of Ideo, a recruitment company based in Germany, for DM2.9m (£1.25m) cash. Ideo had pre-tax profits of DM309,000 on sales of DM13.1m in 1994.

Meyer advances 24% but warning hits share price

By Andrew Taylor, Construction Correspondent

A warning of lower building material sales and timber prices knocked almost 4 per cent off the value of Meyer International shares yesterday.

A statement by Mr John Dobby, chief executive, that "the current financial year has not started well" took the gloss off a 24 per cent rise in pre-tax profits to £51.6m (£41.8m) in the year to the end of March. Meyer's shares only fell 12p to 307p.

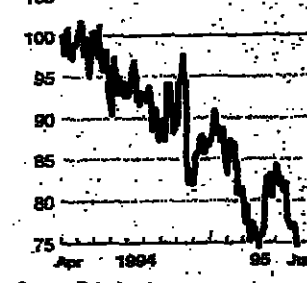
Mr Dobby said volume sales at Jewson, the UK builders' merchants were 4 per cent lower than in April and May last year, although the cash value of sales was about the same, reflecting previous price increases.

The company's British and Dutch timber businesses, however, had been hit by sharp fluctuations in their price of construction timber.

The weighted average price of the group's UK timber prod-

Meyer International

Share price relative to the FT-SE-100



Source: Datastream

ucts had declined by 9 per cent since December, almost wiping out a previous increase of 10 per cent, since April, 1994.

In the Netherlands, white softwood prices had fallen by 15 per cent since last autumn. Sales also had fallen due to a building strike in the Netherlands during March and April, said Mr Dobby.

He said the depressed state

of the UK housing market was inhibiting sales of building materials, although improvements in efficiency, following management changes at Jewson, should help underpin margins.

Profits at Jewson rose by 12 per cent to £23.2m (£20.7m) with turnover increasing by 10 per cent to £468.4m (£425.1m). Forest products which import and distributes timber, wood products and laminates in the UK, US and Canada, increased operating profits by 18 per cent to £22.1m (£19.6m).

Profits from the Netherlands, where the private housing market has been strong rose from £13m to £14.4m. An exceptional loss of £3.4m on the sale of three German businesses was partly offset by profits of £1.4m (£200,000) on sale of properties.

Interest charges fell from £8.5m to £6.8m helping earnings per share to rise from 24p to 28.4p. The final dividend is increased to 7.3p (6.6p) making a total of 11.5p (10.8p).

Allied Colloids up 10% as it beats raw materials price rise

By Geoff Dyer

Allied Colloids, the specialty chemicals group, yesterday announced a 10 per cent increase in pre-tax profits despite rises in raw material prices of over 20 per cent in some instances.

The higher costs did not dent profit margins, which remained at 14.1 per cent, and sales improved 9 per cent to £356m (£327m). Pre-tax profits in the year to April 1 were £50.3m (£45.9m).

Mr David Farrar, who takes over from Mr Peter Flesher as managing director later this month, said that "we are a little cautious in the short-term until the raw material situation has settled down". Europe had seen the worst of the price rises but there were still some

to come in the US.

The Bradford-based group said that sales were ahead at all the product divisions, with paper increasing the most to £81m (£77m), up 21 per cent. Pollution control sales were ahead 7 per cent at £79m (£74m).

Capital expenditure more than doubled to £60m (£26.7m), including the £27m expansion of the manufacturing facility at Cleethorpes for the coatings business, which had been held back by lack of capacity. A further £52m was planned for this year.

Earnings per share were 14 per cent higher at 7.09p (6.33p) and a final dividend of 2.05p (1.86p) is proposed, making 2.6p (2.39p) for the year, a 10 per cent increase.

The shares fell 2 1/2p to 129 1/2p yesterday.

Organic growth helps Powerscreen advance to £29m

By Tim Surt

Powerscreen International, the Ulster-based engineering group, reported an 18 per cent increase in profits following sharply increased sales of its industrial screening and stone crushing equipment.

The shares rose 6p to 308p after it announced pre-tax profits up from £24.6m to £29m on turnover 61 per cent ahead at £196.8m (£122.5m).

The improvement was fuelled by organic growth, although the sales were flattered by a £25.2m maiden contribution from Benford, the construction equipment manufacturer acquired from BM Group for £17.1m last year.

"Our existing businesses have been helped by the growing trend towards recycling

building materials and extracting aggregates from land fill sites," said Mr Barry Cosgrove, finance director.

That demand helped lift profits on continuing operations from £24.1m to £28.8m. The screening side contributed £19.6m (£17.1m), although margins narrowed from 25 per cent to 21.4 per cent.

Mr Cosgrove also hailed a buoyant performance by the materials handling division, where cost-cutting at Benford and buoyant demand for agricultural equipment pushed profits up 67 per cent to £4.52m (£2.72m).

The division is expected to grow still faster following the signing last month of a £50m manufacturing deal with John Deere, the world's largest agricultural equipment dealer.

Racal shares fall despite 27% rise

By Christopher Price

Tough trading conditions at its data communications division and a warning of a profits shortfall from its radio communications business undermined a 27 per cent rise in pre-tax profits at Racal Electronics.

The shares fell 8p to 250p. Profits before exceptional rose from £46m to £58.3m, with turnover from continuing operations advancing 7 per cent to £398m. With the inclusion of 1994's £19.6m goodwill write-down, pre-tax profits more than doubled from £26.58m. Turnover including discontinued operations increased 4 per cent to £950.2m.

A final dividend of 3.25p is proposed, making a total 5p (4.25p). Earnings per share were 13.65p (5.47p).

The data communications business showed a quadrupling of profits to £14.3m, although this included a £8.8m contribution from Camelot, the National Lottery operator. Although Camelot made profits of only £10.8m and Racal's

share is just 22.5 per cent, the company has capitalised its £6.4m investment in the National Lottery operator, boosting first-year profits.

Without that, data communications profits rose 63 per cent to £5.7m, boosted by a strong performance from the Network Services division. Turnover rose 3 per cent to £384.2m. Within that, revenues from data products were 25 per cent short of expectations at £310m.

Radio communications increased profits 15 per cent to £20.5m on turnover 24 per cent higher at £179.4m. The company warned of "reduced profitability in the current year".

In the defence business, the company said the purchase of Thorn Sensors on March 31, for £18.9m, would result in a provision of £22m for "reorganisation costs and contract liabilities which will result in a goodwill write-off of some £7m". Mr David Elsbury, chief executive, said he expected the division to make £10m in the current year on turnover of £170m.

Sharp recovery at Apollo

By Paul Cheeswright, Midlands Correspondent

Apollo Metals, the Birmingham-based metals processor and distributor, had a sharp recovery in its first half, with pre-tax profits of £1.31m compared with a loss of £219,000 in the same period of 1993-94 and profits of £510,000 in the second half.

Sales reached record levels in the six months to March 31 at £256.86m (£116.24m). Although the rise came partly because of higher metal prices, there was an improved performance across all sections of the business.

Apollo's figures have also been lifted by the acquisitions last November of Aviation Metals, based in Milton Keynes, and Krifinn in Finland.

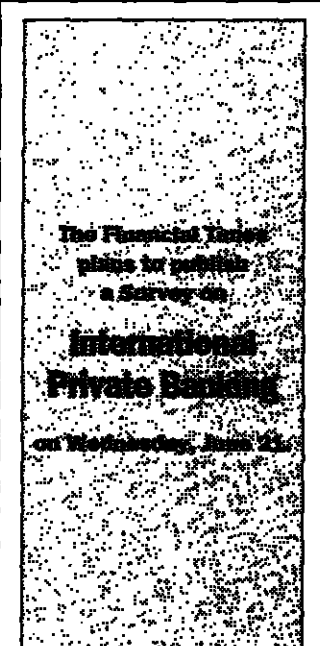
The 1993-94 first-half performance was affected by the costs of reorganisation in Germany.

Earnings per share were 3.4p (losses of 2p).

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TENDER NOTICE
UK GOVERNMENT
ECU TREASURY BILLS

For tender on 13 June 1995

- The Bank of England announces the issue by Her Majesty's Treasury of ECU 1,000 million nominal of UK Government ECU Treasury Bills, for tender on a bid-yield basis on Tuesday 13 June 1995. An additional ECU 50 million nominal of Bills will be allotted directly to the Bank of England for the account of the Exchange Equalisation Account.
- The ECU 1,000 million of Bills to be issued by tender will be dated 15 June 1995 and will be in the following maturities:
ECU 200 million for maturity on 13 July 1995
ECU 500 million for maturity on 14 September 1995
ECU 300 million for maturity on 14 December 1995
- All tenders must be made on the printed application forms available on request from the Bank of England. Completed application forms must be lodged, by hand, at the Bank of England, Customer Settlement Services (formerly Securities Office), Threadneedle Street, London not later than 10.30 a.m., London time, on Tuesday, 13 June 1995. Payment for Bills allotted will be due on Thursday, 15 June 1995.
- Each tender at each yield for each maturity must be made on a separate application form for a minimum of ECU 500,000 nominal. Tenders above this minimum must be in multiples of ECU 100,000 nominal.
- Tenders must be made on a yield basis (calculated on the basis of the actual number of days to maturity and a year of 360 days) rounded to two decimal places. Each application form must state the maturity date of the Bills for which application is made, the yield bid and the amount tendered for.
- Notification will be despatched on the day of the tender to applicants whose tenders have been accepted in whole or in part. For applicants who have requested Euroclear or CEDEL, Bills will be credited in the relevant systems against payment. For applicants who have requested definitive Bills, Bills will be available for collection at Customer Settlement Services, Bank of England after 1.30 p.m. on Thursday, 15 June 1995 provided cleared funds have been credited to the Bank of England's ECU Treasury Bills Account No. 59005516 with Lloyds Bank Plc, Bank Relations, St George's House, PO Box 787, 8-8 Eastcheap, London EC3M 1LL. Definitive Bills will be available in amounts of ECU 10,000, ECU 50,000, ECU 100,000, ECU 500,000, ECU 1,000,000, ECU 5,000,000 and ECU 10,000,000 nominal.
- Her Majesty's Treasury reserves the right to reject any or part of any tender.
- The arrangements for the tender are set out in more detail in the Information Memorandum on the UK Government ECU Treasury Bill programme issued by the Bank of England on behalf of Her Majesty's Treasury on 28 March 1988, and in supplements to the Information Memorandum. All tenders will be subject to the provisions of the Information Memorandum (as supplemented) and to the provisions of this notice.
- The ECU 50 million of Bills to be allotted directly to the Bank of England for the account of the Exchange Equalisation Account will be made available through sale and repurchase transactions to the market makers listed in the Information Memorandum (as supplemented) in order to facilitate settlement.
- Copies of the Information Memorandum (and supplements to it) may be obtained at the Bank of England. UK Government ECU Treasury Bills are issued under the Treasury Bills Act 1877, the National Loans Act 1968 and the Treasury Bills Regulations 1968 as amended.

Bank of England
6 June 1995

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FINANCIAL TIMES SURVEY

ARMENIA

Wednesday 7 June 1995

Page 3: a profile of the president as he prepares for elections

Page 4: a business traveller's guide to the capital, Yerevan

Economic reforms prompt hopes of renaissance

For centuries, Armenians have endured tyranny and deprivation. Government policy could reward their stoicism but only, says Chrystia Freeland, if married to a commitment to democracy

State has been unkind to the Armenian people. Since the fifth century, their country has been almost constantly subject to foreign domination. And, in 1915, they were the victims of genocide when Ottoman Turkey massacred an estimated one million of its Armenian inhabitants. Even the natural world has been hostile: the earthquake of 1988 devastated the country, killing 25,000 people and causing millions of dollars worth of damage.

Over the past four years, while the entire former Soviet Union has been struggling to cope with the economic and political legacy of communism, Armenia has laboured under a double burden. In addition to the massive problems of the post-communist transition, it has endured an economic blockade from Azerbaijan and Turkey which has led to an energy crisis so acute that electricity is available in most homes for only one or two hours a day.

But Armenia's long history of adversity has proven to be a useful preparation for its current difficulties. Ordinary Armenians have adapted to the severe energy shortage with remarkable cunning, rigging up small power generators in their homes and even running television sets off automobile batteries.

Necessity is the mother of invention, and the resilient ingenuity with which Armenians have coped with one of the most severe economic crises in the former Soviet Union is also animated by the deep-seated sense of national identity they have nursed through 15 centuries of foreign rule. From the long-range historical perspective, that comes naturally to most Armenians, their economically devastated and isolated country is actually in the midst of one of the most promising opportunities for a national renaissance that it has experienced in more than a millennium.

For the first time in centuries, Armenians control their own, sovereign state, albeit one which, in the eye of the Armenian nationalist, occupies only a fraction of the true national homeland. Moreover, Armenians, who, since the fifth century, have tended to be on the losing side of territorial wars with their neighbours, have managed to wrest Nagorno-Karabakh, a mountainous enclave within Azerbaijan, from the control of their ancient enemies, the ethnically Turkish Azis.

The Armenian government scrupulously disavows any desire to incorporate Karabakh into greater Armenia. But the fact that the territory is now controlled by its Armenian residents, rather than Baku, is felt to be Armenia's great national achievement of the past four years, and one for which most Armenians are cheerfully willing to endure far more than electricity blackouts.

Slowly, this Armenian stoicism for the sake of national survival is being rewarded. The brightest star on the horizon is the economy. The lack of electricity and hot water sometimes obscures the unexpected fact that, in many respects, Armenia is one of the models of post-communist economic reform in the former Soviet Union.

As Armenian officials explain, the economic blockade has acted as an unlikely catalyst for reforms, forcing Yerevan to adopt radical economic measures that more prosperous former Soviet republics could afford to delay.

As Mr Bagrat Asatryan, the chairman of Armenia's Central Bank, explains: "Maybe the fact that we have no natural resources is our salvation. We joke that if an oil well were to be discovered we would have to cover it up quickly. Our people today understand that, in the conditions which God has given us, our republic's only way to survive is through liberal economic policies."

In Armenia, the energy blockade exacerbated the sharp decline in output experienced by all of the former Soviet republics following the collapse of communism. GDP fell by 52 per cent in 1992 and dropped another 15 per cent in 1993. But last year it grew by 3 per cent and government officials expect it to increase by at least 5 per cent this year.

Sceptics point to the fact that Armenia's robust new economic indicators are a statistical fluke born of the country's depressed starting point. But the gentle upturn in the economy is also the result of the radical economic reforms that the government has pursued since 1991, when Armenia formally declared its independence from the Soviet Union.

The first radical move came in 1991, when the government implemented a tough land privatisation programme. Land privatisation, which has put more than 80 per cent of agricultural land in the hands of private farmers, who are now free to buy and sell their holdings, has acted as an important linchpin for the rest of Armenia's economic reforms.

base for anti-reform communist politicians. But Armenia's pioneering land privatisation has transformed the countryside into one of the most important sources of support for market reforms and, by weaning farmers off government subsidies and making them more efficient, has helped Armenia to survive the energy blockade.

"During the most difficult times which our republic endured, the energy crisis and the blockade, I think we were saved from famine by land privatisation," Mr Asatryan says. The second important achievement of Armenia's economic reforms was the result of circumstances beyond Yerevan's control. Until the autumn of 1993, Armenia was a part of the rouble currency zone, and like other republics within the rouble's orbit pursued spendthrift monetary and fiscal policies. But, in November 1993, Russia's decision to exclude other republics from the rouble zone forced Armenia to introduce its own currency, the dram, and independently set its monetary and fiscal course.

After a shaky start, the dram has proven to be a success. Since May, 1994, the nominal exchange rate has been stable, and the dram has sharply appreciated in real terms over the same period. The government's battle with inflation, which averaged 46 per cent a month in the first quarter of 1994 but was down to 1.2 per cent in March, has been an equally important achievement. Oil-rich Russia, struggling with inflation of nearly 18 per cent a month at the beginning of this year, can still only dream of the macro-economic stability Yerevan has already attained.

The one sphere in which Armenia's economic reforms have lagged has been industrial privatisation, but the government has pledged to implement a mass privatisation programme this year.

However, Armenia's impressive internal macro-stabilisation is likely to have little real significance unless it is accompanied by the more difficult achievement of a rapprochement between Armenia and its largely hostile or unstable neighbours. Endowed with scarce natural resources, landlocked Armenia is unlikely to develop very much beyond a subsistence economy, no matter how skilled the economists in its cabinet, unless its diplomats can negotiate an end to the economic blockade.

Government officials are hopeful that, slowly, the political situation is improving. "Armenia occupies an important geopolitical crossroads and, as a result, a lot depends on our relations with our neighbours," says Mr Armen Yeghiazarian, minister of the economy and a member of the government troika that has masterminded the economic reforms. "But there are some signs, unofficial ones, that our relations with Turkey and Azerbaijan are improving."

The past year has brought some encouraging signals that give weight to the official optimism in Yerevan. The blockade of trade and transport routes through Azerbaijan, traditionally Armenia's principal avenue into the world, was triggered by the war over Nagorno-Karabakh. More than a year ago, that battle settled into an uneasy stalemate, with local Armenians in control of the disputed enclave and large swathes of Azeri territory between Karabakh and Armenia occupied by Armenian forces. Azerbaijan is, naturally, little pleased with this status quo, but more than a year ago the warring parties agreed a ceasefire that has generally been honoured, despite the absence of neutral peace-keeping forces.

Yerevan is hopeful that the next stage will bring an incremental lifting of Azerbaijan's blockade, perhaps in exchange for some of the occupied land held by Armenian forces. The delicate detente between Armenia and Azerbaijan has also slightly eased relations between Yerevan and Turkey, which closed its border with Armenia at the height of the Karabakh dispute. Turkey has already opened its air corridor to Armenia and, thanks to a US Armenian lobby, is under gentle pressure from Washington to lift the blockade further.

Armenia's isolation has been further eased by the gradual political stabilisation in neighbouring Georgia. Georgia is an important transit route for energy, particularly natural gas, and civil war there compounded the difficulties Armenia faced because of Azerbaijan and Turkey's blockade.

But one of the most promising windows on to the rest of the world for Armenia is Iran. Nothing better exemplifies Armenia's unhappy geopolitical destiny than the fact that Iran, one of the pariahs of the western world, is Armenia's most stable, reliable and friendly neighbour. The two countries have an ancient history of good trading relations.

In an effort to break out of its geographic isolation, Armenia, whose foreign minister speaks fluent Persian, has been nursing closer economic links with Iran. Iran is now second only to Russia among Armenia's trading partners, and Yerevan sees a planned

gas pipeline from Iran as its most reliable way out of the energy blockade. Armenia's other unlikely saviour is Medzamor, a nuclear power station which the government hopes to restart within the next few weeks. The two water-cooled reactors at Medzamor were shut down in 1989, after the 1988 earthquake led Armenian public opinion to question the wisdom of operating a Soviet-constructed nuclear power plant in one of the world's most seismically precarious regions. But four cold winters have led Armenians to reconsider and, to the consternation of western observers, one of Medzamor's reactors is scheduled to be back on line by the autumn.

Armenians, who argue that the west has been quick to complain about Medzamor but has rebuffed most of Yerevan's requests for technical assistance, are unsympathetic to western worries. "It is easy to sit in Brussels and say the Armenians should not start up their nuclear reactor because it is not safe enough," says Mr Vahan Papazian, Armenia's foreign minister. "But here in Armenia we have a terrible energy crisis and we are not willing to endure another frozen winter."

But if Armenia's ability to cope with some of the most difficult economic circumstances facing any former Soviet republic is an uplifting lesson in the uses of adversity, political trends in the republic are more disheartening. Armenia has long prided itself on being an oasis of democracy and stability in a region known for civil war and authoritarian politicians. But, as it prepares for July parliamentary elections, the republic's first, post-communist bal-

lot, it has begun to display the undemocratic inclinations of its neighbours. The most worrying development is the government's suspension of one of the most popular, emigré-based opposition parties, popularly known by its Armenian shorthand as Dashnak. The crackdown on the Dashnaks, and the closure of many opposition newspapers, have raised serious doubts about Armenia's democratic credentials.

Equally worrying is a proposed constitution that will be decided by a popular referendum at the same time as the parliamentary elections. Western constitutional experts say the draft, which government officials are confident will be passed, will introduce the most powerful presidency anywhere in Europe.

Even members of the government agree that Armenia has some way to go before it becomes a fully democratic state. "Armenia is certainly not a model of democracy," says Mr Yeghiazarian. "Armenia is a country which is trying to become democratic, and that's not something you can do in four years."

Since 1991, Armenians have responded to severe external challenges with a remarkable national resilience and commitment to tough economic reforms. As the economy slowly improves, and the external threats begin to recede, Armenia's most dangerous temptation is to drift into the type of authoritarian political system that appears to have lured many of the former communist states. Armenia has a long history of resisting external enemies, but over the coming year Yerevan's priority should be to set its own house in order.



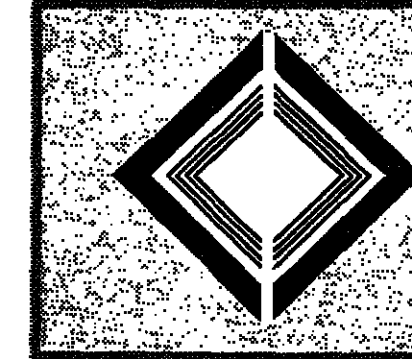
Landscape of change: the life of farm workers has been revolutionised by the government's land privatisation programme

land, it has begun to display the undemocratic inclinations of its neighbours. The most worrying development is the government's suspension of one of the most popular, emigré-based opposition parties, popularly known by its Armenian shorthand as Dashnak. The crackdown on the Dashnaks, and the closure of many opposition newspapers, have raised serious doubts about Armenia's democratic credentials.

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- The currency of the balance sheet has been increased 4 times within the year, the share's real value is equivalent to USD 1,145.
- The outside funds have the tendency to strong growth and make the equivalent of about USD 5,0 million
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The republic in brief: key facts

Government

Ruling party: Armenian National Movement (ANM)
Head of state: Mr Levon Ter-Petrosyan, president
Head of government: Mr Brant Bagratian, prime minister

Main cities

Yerevan (capital); Gyumri; Kirovakan

Economic indicators

Real GDP growth %: 2.3 (1993/94)
Average wage in Yerevan: \$4-\$6 per month (first quarter of 1995)

Area and population

Area (sq km): 29,000
Total population: 3.7m (approx)

Main languages

Armenian (official); Russian (2 per cent); others (2 per cent)

Ethnic composition

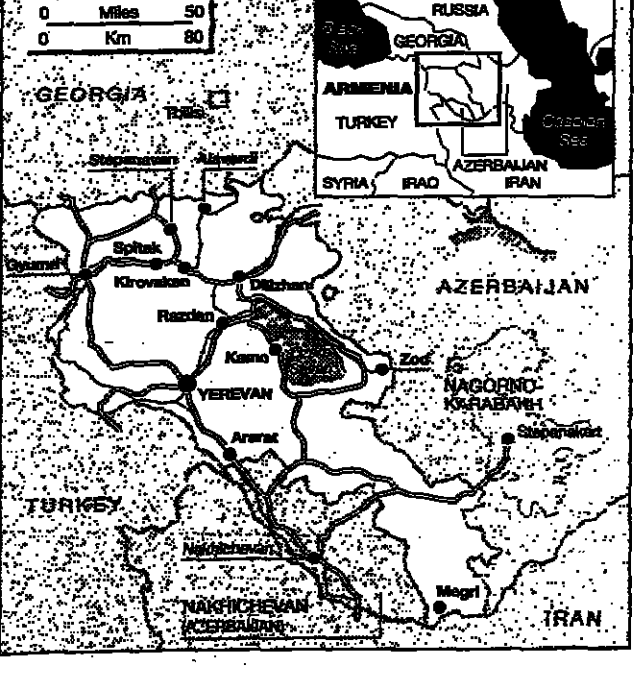
Armenians (93 per cent); Kurds (2 per cent); Russians (2 per cent); others (3 per cent)

Religion

Armenian Orthodox (94 per cent); other (6 per cent)

Currency

Dram (since November 1993).
Exchange rate (June 5 1995): £1 = 649.676



Working hours

Offices: (Mon - Fri) 0900 - 1800 (appointments best between 0900 and 1000)
Shops: (Mon) 0800 - 1800, (Tue - Sat) 0800 - 2100

Public holidays

Dec 31, Jan 1 - 2 (New Year)
Jan 6 (Christmas)
April 24 (Day of remembrance of the victims of the genocide)
May 9 (Peace day)
May 28 (Celebrates declaration of first republic, 1918)

Climate

The average winter temperature in Yerevan is -4°C, while summer averages 25°C. Annual rainfall in Yerevan averages 33cms but is much higher in mountain regions.

Time

Three hours ahead of Greenwich Mean Time

Main ministries

Ministry of the Economy: 375010 Yerevan, Republic Sq 3. Tel: 2-627-342, 587-621
Ministry of Finance: 375010 Yerevan, Melik-Adamyan St 1. Tel: 2-623-745, 527-083
Ministry of Foreign Affairs: 375019 Yerevan, Marshal Baghramyan St 10. Tel: 2-520-238
Ministry of Trade: 375009 Yerevan, Teryan St 69. Tel: 2-662-691
Ministry of Light Industry: 375033 Yerevan, P Kochar St 4. Tel: 2-226-600
Ministry of Transport: 375015 Yerevan, Zakyan St 10. Tel: 2-525-268
Ministry of Agriculture: 375010 Yerevan, Republic Sq 3. Tel: 2-524-641
Ministry of Construction: 375010 Yerevan, Tumanyan St 5. Tel: 2-539-080

Dialling code

Since May 27 Armenia has had direct telephone links via BT and an Intelsat satellite with more than 50 countries worldwide, replacing the previous routing via Moscow. The new code for reaching the country is 00 374 (formerly 00 7 855)

Sources: Europa World Yearbook 1994, Statesman's Year-Book 1994-5, ECWD Kaleidoscope, Jan 1995, EIU Country Profile 1994-95, EIU Country Report, 1st Quarter 1995, World of Information, Mar 1994

ARMENIA 2

Sound macro-economic policy is making up for some of the ravages of war, writes Chrystia Freeland

Blockade belies increase in stability

Armenia is more likely to be held up as a sad example of economic disaster than as a model of successful market reforms. The truncated branches of the once shady trees in downtown Yerevan, the Armenian capital, bear mute testimony to the hard times Armenia has endured since the collapse of the Soviet Union in 1991.

The trees were denuded of their loftiest branches in the difficult winters of 1992 and 1993 as Armenians first struggled to adjust to an economic blockade by Azerbaijan which made heating, hot water and lighting a luxury.

But the economic blockade, imposed by Azerbaijan and Turkey as part of the conflict over the disputed enclave of Nagorno-Karabakh, now controlled by local Armenians, has obscured the radical economic reforms which Yerevan began in 1991 and which have today taken the country a long way down the path of transition from communism to a market economy.

Armenia's boldest reform, and one that has yet to be duplicated in more prosperous former Soviet republics such as Russia or Ukraine, is a land privatisation programme that was implemented in the spring of 1991. The programme, which Armenians hope will serve as a model for other former Soviet republics, was both simpler and more radical than many of the partial land reform plans that are now being tested at regional level in other parts of the former USSR.

Collective farms were divided into as many parcels as there were households in the collective. Then, in the spring of 1991, throughout Armenian villages, peasant families gath-



Mr Bagrat Asatryan, Central Bank head and quiet 'revolutionary'

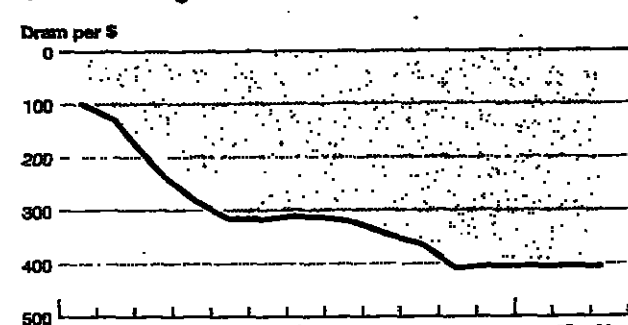
ered in their town's central square and the head of each household drew a lot. Each lot corresponded to one of the parcels of land and became the family's new, private farm.

Another important development, which comes fully into force this year, is the introduction of a new system of agricultural taxation.

Taxes are based on the potential production of the arable land owned by each farmer. This not only helps to compensate for the inevitable inequality between households that received coveted lowlands fields rather than less arable mountain plots, but also discourages land speculation by taxing idle fields as heavily as those that are being farmed.

As Mr Armen Yeghiazarian, minister of the economy, explains, "the land taxation system gives farmers an incen-

Dram exchange rate



Source: Central Bank of Armenia

tive to sell their land if they cannot farm it profitably".

The programme, however, has also had its limitations and built-in inequities. For the first three years, there was a moratorium on selling the land, though it has now expired. Moreover, the land privatisation system benefited some groups more than others. Tractor drivers, for example, did particularly well, being eligible not only for the land lottery but also for ownership of the collectives' tractors, which were divided among them.

Today, this is proving to be a lucrative perk, as they are able to hire out the services of their tractors to less lucky neighbors.

But, overall, Armenia's early reform of the agricultural sector, which has proven to be the area most resistant to market transformations in other for-

mer Soviet republics, has served as an important underpinning of the country's broader economic reforms. Farmers in other post-communist countries, such as Russia and Ukraine, have been one of the most stubborn barriers to macro-economic stabilisation programmes because of their demands for continued government subsidies. By contrast, Armenia's newly created rural middle class is one of the strongest supporters of reforms and one of the most committed opponents of the communist and socialist parties.

"By giving land to the peasants we created a rural bourgeoisie," says Mr Yeghiazarian. "The people are afraid that the communists might want to take away their land and so they support the current government and its reforms."

After its brave start with

agrarian reform in the spring of 1991, Armenian economic reformers were forced to slow down as their country became preoccupied with the war for Nagorno-Karabakh. Russia's decision to exclude former Soviet republics from the ruble zone in the autumn of 1993 was a salutary shock. Armenia was initially unprepared to meet the challenge of running an independent monetary and fiscal policy.

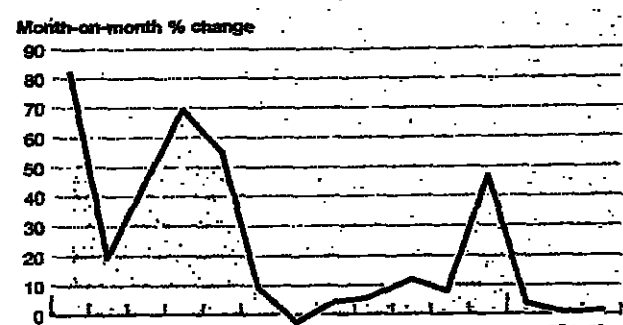
"When Russia unilaterally introduced its own currency in November, 1993, we obtained so called independence, but at first it brought us problems, rather than freedom," explains Mr Bagrat Asatryan, chairman of Armenia's central bank.

The first few weeks following the introduction of the dram, Armenia's new national currency, were disastrous. The Central Bank was technically

unprepared, the country had almost no hard currency reserves, the economy was in the throes of hyper-inflation, and the most severe period of the energy crisis had begun. In these inauspicious circumstances, the Central Bank opted to fix the exchange rate of the dram against the dollar, a policy that survived only for a fortnight.

But in January, 1994, Mr Asatryan, an academic economist, assumed his new duties as chairman of the Central Bank and began to turn the situation around. His first tasks went beyond the standard remit of a central banker: restoring lighting and heat to the Central Bank offices. Mr Asatryan then undertook a more fundamental reform, sacking the bank's entire Soviet era staff.

Inflation



Source: Central Bank of Armenia



Mr Armen Yeghiazarian, minister of economy and agent of change

"Although I am not a revolutionary by nature, I took this first revolutionary step," says Mr Asatryan, whose academic past is reflected in his mild, professional manner.

The internal reorganisation of the bank and Mr Asatryan's insistence that he be given independence from the government and cabinet allowed him to pursue a tough monetary course, which, by the spring of 1994 had stabilised the dram and brought inflation down to an average of 3 per cent a month.

For Armenia's old industrial guard, which had enjoyed bailouts from the Central Bank, Mr Asatryan's regime was an unwelcome shock.

"During the first month, factory directors and their chief accountants called me every day, asking for cheap credits," Mr Asatryan says. "But, by the

second month, the calls came less often, and only cabinet ministers dared to pick up the telephone. Now, as stabilisation has taken hold, I only get one or two calls a month."

Mr Asatryan also imposed the type of strict constraints on commercial banks that are currently the subject of an intense political battle in Russia. Last year, he increased the reserve requirements to start a bank 40 times. (The minimum had previously been a mere \$2,500 and the change forced a third of Armenia's commercial banks into receivership.)

"In the past, for the price of a used car you could set up a bank," Mr Asatryan says.

He also sacked 80 per cent of the government regulators of the commercial banking sector, hinting that their corrupt practices had allowed pyramid schemes thinly disguised as commercial banks to proliferate in Armenia.

Mr Asatryan's austere monetary and regulatory policies, coupled with the government's fiscal restraint, have made Armenia one of the former Soviet Union's unlikely models of macro-economic stabilisation.

The government hopes this year's mass privatisation programme, and a stand-by loan, which it expects to receive from the International Monetary Fund sometime this summer, will help to make Armenia's propitious economic starting point sustainable.

But Mr Asatryan and his reformist colleagues in the cabinet realise that until Yerevan's diplomats manage to negotiate an end to the blockade, long-term investments are unlikely to flow into Armenia, no matter how sound its macro-economic strategy.

Matthew Kaminski on Indian investment in clothing company, Tosp

Foreign aid for textile plant

The hope for Armenia's successful transition to a market economy rests on manufacturers such as Tosp, a textile factory housed in a single compound in Yerevan's industrial district.

Known across the Transcaucasian country for its white underwear and colourful T-shirts, Tosp was among the first ten state companies privatised last month under the voucher self-off scheme. Workers received a 20 per

cent stake for free and then bought another 16 per cent with their vouchers, which have a face value of 20,000 drams. As in Russia, the vouchers are freely transferable and there are no limits on

foreign participation. The company's auction, done over two months, was fully subscribed and a foreign investor, an Indian of Armenian descent, took a 30 per cent share.

"We have very good factories

that do not need very much investment," says Pavel Ghalakhchian, chairman of the state privatisation board, noting that Armenia plans to sell another 50 companies in the next two months and ambitiously wants to offer 800 large and medium-sized enterprises by the year's end.

But, he adds, Armenia has opened the privatisation process to outsiders in order to attract foreign investment. "Our state policy is aimed at bringing in foreign investors. The more foreign capital, the richer our government will be and the better off our country will be."

Improvisation has helped the company to stay afloat in Armenia's difficult business environment, but it needs outside help.

An energy crisis, transport difficulties and raw material shortages mean that only 160 of the 870 employees (down from 1,500 in the 1980s) are needed and production stands at a fifth of the output in the last years of the Soviet Union.

Tosp, however, has fared better than most. An on-site generator helps power the company's relatively modern and western-built machinery, including an Italian stabiliser. A west German production line was installed in 1989 but has never been turned on because output must reach 80 tonnes per month for it to be efficiently used. Unlike most Armenian factories, Tosp rarely suffers electricity power cuts. This is because of its participation in Armenia's clearing payment system for Turkmen gas. Tosp supplies 1.2m in textile products each year.

with an assured market in the central Asian state, as part of a barter deal for gas deliveries. This not only means that, unlike many of its counterparts in the former Soviet Union, the company has managed to avoid running up electricity arrears, but also that it is owed \$80,000 by the Armenian government.

The biggest problem is the lack of raw materials. A joint venture with Avir of Iran to supply cottons has fallen apart, but Tosp recently signed an agreement with an Indian company to import textiles. Yans Ltd, founded by the Indian investor who took a 30 per cent stake in Tosp, has opened a credit line to fund the imports from India, delivered overland through Iran.

"The diaspora is very important for us," says Suren Bekirsky, deputy director of Tosp, "because most companies find local bank credit, offered at high interest rates, prohibitively expensive and cannot fund the overhaul of the industrial sector."

Once goods have been produced, the old Soviet wholesale network provides a good outlet, if efficient transport means are found. "We have a ready market of 240m customers," Bekirsky says, referring to the other ex-Soviet republics. The company currently flies its goods, made from 20-25 tonnes of cotton per month (down from 110 tonnes in 1991), across the former Soviet Union.

Increasing output will not be easy. The cost-per-unit breakdown highlights the restructuring task ahead. About 40 per

cent goes in financing costs, such as interest rates, under-scoring the pressing need for working capital that foreign investors such as Yans might be able to provide. Salaries and benefits make up another 20 per cent.

A Polish business consultant has told Tosp that staff costs should be halved. But the proposal is not likely to find favour with the current management. Bekirsky's mother, Rimma, the general director since 1977, angrily rejects any suggestion that the workers currently underemployed ought to be laid off. "Why are you so cruel?" she asks. "If investors want to give us \$1m, we'll raise output to 200 tonnes per month. We should hire more workers, not send our girls out into the streets."

An Armenian raised in Syria and educated in India, Avadis Janiachian, the director of Yans, says investors must be patient and understand the strong communal traditions that shape Armenian "psychology and outlook".

After losing \$300,000 in commercial ventures, Tosp is Yans's first foray into manufacturing in Armenia. Janiachian warns that large Armenian companies are "very protective" of employees, but adds that the first shareholders' meeting will consider restructuring. The factory was attractive not for its management but for its "good machinery" and lack of "looting", he says.

Janiachian, a 33-year old who has married a local Armenian and plans to raise his children in the republic, only smiles when reminded about the company's and the country's various problems. "I feel sorry for the Armenians abroad who are not participating in this process," he says. "We've lost a lot in three years, but we still believe a day will come when the sun will shine."



Ray of hope: the Medzamor power station may solve Transistor's - and the country's - energy problem. James Hall

The high-tech Transistor project is short of funds

New factory in crisis

Beyond Yerevan's seven hills, the Transistor semi-conductor factory at Ashtarak is an unfinished monument to modernisation in the former Soviet Union. As Boris Yeltsin stood astride the Soviet tanks in front of the Russian White House in 1991, construction on the large Soviet project stopped - just before the last rubble was due to arrive from Moscow.

Today, the managers at the state-owned factory are desperately trying to raise outside

financing to finish the job and secure a niche for Armenia as a high-tech manufacturing centre in the old Soviet bloc.

Work on the Ashtarak facility - about 30km from Transistor's dilapidated semi-conductor plant in Yerevan - began in the early 1980s. About \$100m was invested, including \$65m worth of western machinery, according to Haikaz Bakhshtian, the English speaking first deputy director of Transistor. The intention was to create an oligopolistic supplier of high powered transistors and power integrated circuits often used in electric motors.

On the plant's 20 hectare facility, 4,000 sq ft of clear room space houses Swiss, US and Japanese machines. One hundred and fifty workers keep the plant impeccably clean. Nothing has disappeared in four years. Wellman furnaces, a Balzer evaporator and a German-made electron beam stand side by side, their warranty tags still attached. "It's fantastic," says Kenneth Clark, managing director of the UK-based Integrated Technologies, which worked on the project between 1986 and 1991. "Ashtarak is one of the leading factories in the whole of Europe. The machinery is all first class. Semi-conductors are a high priced commodity and the world market exists."

Ashtarak's good equipment is complemented by a potentially capable work force. The University of Armenia has a faculty that is well-suited to train specialists in the sector. Ashtarak hopes eventually to employ 1,800 people. The company's business plan, presented to the European Bank for Reconstruction and Development and western commercial banks, calls for an additional investment of \$20m to fund additional equipment, install a gas system and cover running costs for the first three years of operation. Profit margins are expected to reach 40 per cent, on the strength of exports to ex-Soviet republics

and other countries outside the former Communist bloc. But, even when Armenia offered to issue a bond or put the company assets against the loan, no bank was interested.

Clark, who helps co-ordinate the financing effort in order to get back money his company is owed for the initial technical work, guesses ignorance about Armenia and worries about the high risk deter commercial banks from lending the monies. But he is now "very hopeful" a US trust fund, which he declined to name, might help.

Poor financial services are just one deterrent to investment in Armenia, although in March the UK's Midland Bank announced plans to open the first office of a western bank in Armenia.

Like many Armenian companies, Transistor faces serious short-term problems. Russian buyers have not paid all their bills and the stock piles are full with orders significantly lower than in past years, forcing the plant to downsize to 800 workers after employing 1,200 in the days of the Soviet Union. The new plant wants to try to tap the western market but it still needs the old buyers, who are hampered by the economic downturn across the former USSR.

In the drive to find new clients, the marketing department will be the first to be overhauled and, according to Bakhshtian, the entire company may eventually be privatised. A high-tech operation also needs a steady and reliable electricity supply. Gagik Khachatryan, director of the Ashtarak factory, believes Armenia must restart its closed nuclear reactor, built on a seismic fault line, to relieve the current electricity shortages. If not, he says, Transistor will build its own mini power plant on the stream that runs just behind Ashtarak on the dusty Armenian plateau.

Matthew Kaminski

Kanaker Aluminum

Factory main production:

- Aluminum ingots
- Aluminum bands
- Goffered sheets
- Profiles/brackets made of aluminum AD31 alloy
- Aluminum sheets
- Aluminum foil of different thickness for production and household

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ARMENIA 3

The president is taking a tough stance in the race for power, says Steve Levine

Hard line on diaspora groups

Mr Levon Ter-Petrosyan, the Armenian president, is a former college professor with a passion for chess and languages who has impressed many foreign visitors as a steady, Western-minded leader in an unruly sea. But politics can test anyone's image and, a month before parliamentary elections, diplomats are starting to complain about some Soviet impulses in the president.

Western diplomats have criticised Mr Ter-Petrosyan for suspending a leading opposition political party, which he branded "a terrorist and fascist organisation." Western officials have also worried about his jailing of two dozen party members, one of whom died in custody last month, and a shut-down of opposition newspapers. He has even been accused of establishing a classic communist-style political machine to ensure an acceptable result in the July 5 elections.

"It's a phenomenon you see all over the world," says a senior western official in Armenia's capital, Yerevan. "You could have the softest man in charge. But once someone comes to power, he clings to it by all means."

Four years after leaving an academic career at Yerevan State University, Mr Ter-Petrosyan, 50, indeed appears like a man trying to entrench himself and his party in power.

The president, who has studied 13 languages, came to prominence in 1988 as a leader in the so-called Karabakh Committee. The committee pressed the case for independence in a tiny Armenian-dominated

The government has suspended Dashnak political activities, effectively excluding the party from the elections

enclave called Nagorno-Karabakh, which was situated by Josef Stalin inside neighbouring Azerbaijan. Yerevan thus became the site of the first big nationalist demonstrations of the Soviet era - the huge public outpourings in the non-Russian republics that helped bring down the Soviet Union.

The crusade, which led to a still-smoldering, undeclared war with Azerbaijan that has killed at least 5,000 people, informed both contemporary Armenian politics and a new generation of leaders.

Although the Karabakh issue has receded from everyday Armenian political discussions, the edge it gave to Mr Ter-Petrosyan still remains today. Elected president overwhelmingly in 1991, he simply has no formidable challenger.

The only rival who had a national following, Mr Raffi Hovannisian, whom Mr Ter-Petrosyan sacked as foreign minister, has been barred from next year's presidential elections because he is a US citizen.

In trying to understand why Mr Ter-Petrosyan has moved to impose such a tight political grip in Armenia, some analysts look at the nearby examples of chaos that he has witnessed.

In Georgia, leader Eduard Shevardnadze came to power after a rebellion against his elected predecessor, and has since had to bring back his republic from the brink of disintegration. In Azerbaijan, Mr Heydar Aliyev, the president, is leading the republic's fifth government in four years, and had to crush what he called a coup attempt last autumn.

Armenia's relative political stability may be born of its people's post-Soviet tendency to pull together during crises. Azerbaijan, on the other hand,

often changes governments during hard times.

Mr Ter-Petrosyan, however, evidently wants more stability in the run-up to elections.

"They want an assured victory," says a western diplomat in Yerevan.

"What's happened to Ter-Petrosyan," the diplomat adds, "is that he has identified his fate with the fate of the Armenian nation: if he stays in office, at whatever cost, it must be to the benefit of the Armenian people."

In December, Mr Ter-Petrosyan made his first move by going against the chief opposition political party, the Armenian Revolutionary Federation, known by its Armenian language shorthand, "Dashnak."

Dashnak is perhaps the strongest of a handful of Armenian diaspora groups spread through Europe, the US, South America and the Middle East that are also politically influential in Armenia itself.

The groups marshal financial support from abroad for Armenia and Nagorno-Karabakh, and have become politically vital lobbying groups for Armenian causes in Washington and Paris. Last month, diaspora lobbyists helped push a bill through a US congressional

committee that would sever assistance to Turkey if it continues to obstruct US humanitarian aid from reaching Armenia by land.

Increasingly, Mr Ter-Petrosyan's government, while expressing gratitude to the diaspora, has bristled at its attempts to influence Armenian policy. His conflict with Dashnak, however, appears to be especially visceral.

From their side, some Dashnak leaders have felt that they maintained the flame during the diaspora's darkest hours this century, and that they thus possess a right to govern Armenia.

This naturally angers Mr Ter-Petrosyan, whose policies are generally more moderate than Dashnak's. The president, for example, rejects Dashnak's demand that official relations with Turkey be suspended until Ankara concedes the Ottoman government's role in the 1915 massacre of more than a million Armenians.

"The Dashnaks felt they had the God-given right to govern Armenia," says Mr Gerard Libaridian, a senior adviser to Mr Ter-Petrosyan. "They felt that no-one [else] in Armenia was qualified to lead the nation."



Soviet heir: Ter-Petrosyan has to manage a hard transition Edward Teague

elections. Even more controversial, however, was the death in custody of a prisoner, Mr Artavazd Manukian. The prisoner's lawyer has claimed that government security officials refused proper medical treatment to Mr Manukian, who he said suffered daily bleeding, headaches and back pain. Mr Ter-Petrosyan has denied any government liability.

Meanwhile, the parliamentary race is quickly gaining momentum. The elections consist of voting to fill a 190-member parliament and a referendum on a constitution that would create a strong-presidential system.

Most analysts expect the new parliament to have a close resemblance to the current legislative body, which is dominated by state factory directors, local politicians and other allies of Mr Ter-Petrosyan.

The president, western analysts say, has at least partly guaranteed this outcome by arranging the appointment of pro-government chairmen in 129 of Armenia's 150 electoral districts. Such officials in other former Soviet republics have been responsible, if need be, for nudging the vote in the proper direction.

"Here, politicians are intellectuals who only came to politics five years ago, so you would expect a different approach," says a western political analyst in Yerevan. "But they were raised in the Soviet system. They don't know any other way."

The ceasefire in Nagorno-Karabakh may be a year old but the territorial conflict goes on

Two small towns hold key to peace



Farewell to arms: a soldier 'rests' in the secondary line Edward Teague

The nearly deserted Azerbaijani town of Lachin doesn't look very important. Indeed, its battle-scarred collection of burnt and roofless dwellings make it seem beyond regeneration.

Yet, control over it has become a central issue in talks to end the former Soviet Union's longest conflict, a ferocious, seven-year battle between Armenia and Azerbaijan that has killed 5,000 people.

Despite its shambolic appearance, Lachin itself has seen relatively little violence in the undeclared war. But its strategic importance is immense. The hilly town straddles a 130km-long corridor that links Armenia to the actual scene of most of the fighting - the Azerbaijani enclave, Nagorno-Karabakh. This position makes Lachin the main supply route to the battleground, through which Armenia proper funnels assistance to Nagorno-Karabakh's mostly ethnic Armenian population.

The Nagorno-Karabakh Armenians are seeking a separate state from Azerbaijan. As one of the prizes of permanent peace, however, Azerbaijan wants Lachin back.

It appears that, for now at least, Lachin's small new ethnic Armenian population - backed by an armed force that captured the town three years

ago - isn't budging.

"If I were an Azeri, I would by any means fight against Armenians, because every human being should fight for his land," says Mr Gagik Vardanian, Lachin's ethnic Armenian police chief. "But the fact is that we have liberated this town now - irreversibly - and we are proud of that."

The rise of Lachin to a place of prominence on the negotiating table says a lot about the current state of the conflict.

No longer is surrender of the mountainous, kidney-shaped land called Nagorno-Karabakh an issue. This is because its ethnic Armenian population has achieved what most analysts consider an all-but insurmountable advantage over their Azeri opponents.

The Nagorno-Karabakh Armenians now hold a circle of land expanding far beyond the enclave itself, in all encompassing one-fifth of the Azerbaijani republic. The ethnic Armenian positions are considered virtually impregnable because they include most of the region's strategic heights, and because the Azeri forces have demonstrated little will to attack.

In exchange for peace, the ethnic Armenians have agreed to return almost all the territory they hold outside the

enclave. The talks have narrowed largely to control over two small, disputed pieces of property - Lachin and another small town, Shusha.

Parallels can be drawn between Shusha and both the Golan Heights and Jerusalem. Like the former, the town sits on a strategic bluff above the Nagorno-Karabakh capital of Stepanakert, from which, until the ethnic Armenians captured it, Azeri forces lobbed shells on to the city. Like the latter, Shusha is a potent historical symbol to opposing sides.

A look at Lachin, however, is probably the best way to deci-

pher the obstacles confronting those trying to return a sense of normality to the region.

"Every house here was burned down," says Mr Vardanian, surveying the wreckage while driving through the town. "If you see a house with a roof, it means a family has moved into it."

Hardly any of Lachin's houses have roofs - a testament to the slash-and-burn attack style that both sides employed in the war. Once captured, towns were destroyed to prevent the enemy from moving back in.

Because of their battlefield

superiority, most of the damage was wrought by the Armenian side. The city of Agdam, for example, lying just east of the enclave, was all but razed by the ethnic Armenians two years ago.

This means that, even if a peaceable accord is reached in the next couple of years, the hard part of rebuilding has yet to begin.

The positive side is that hardly a shot has been fired in Nagorno-Karabakh since a Russian-brokered ceasefire began in May last year.

Now, the only real skirmish-

ing involves the undeclared combatants - Azerbaijan and Armenia. Forces from the two sides have fired on each other for months from 17 villages located in four regions abutting their common border.

With a whiff of bravado, however, Mr Vardanian asserts that the Azerbaijanis shouldn't try to push things too far.

"I'll give the Azeris some advice," Mr Vardanian says, narrowing his eyes. "If they try to change anything here (territorially), it would not be to their benefit. That's for sure. They fight badly."

Steve Levine

SHOGHAKN

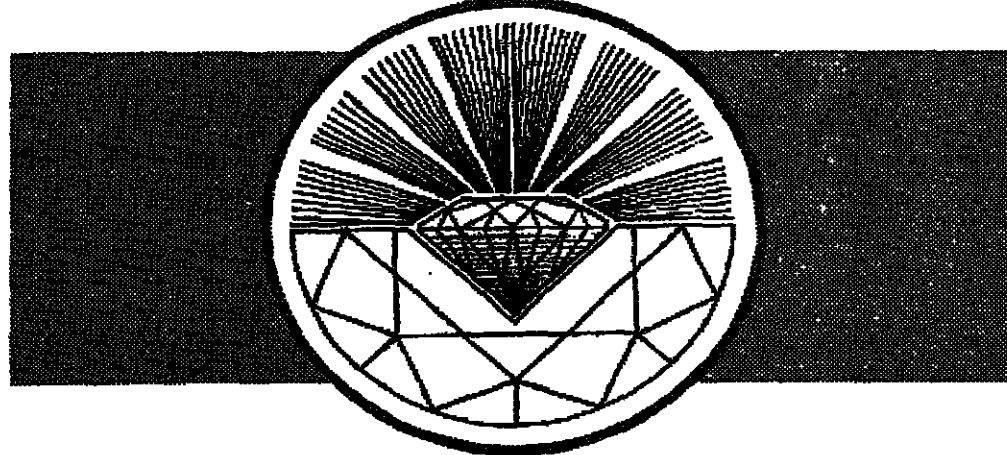
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ARMENIA 4

Matthew Kaminski advises the business traveller

A guide to Yerevan

Torn by war and crippled by economic blockade, Armenia presents visitors with serious challenges. Phones work badly, hot water is scarce and electricity remains in short supply. But, for all the potential snags, the country can be a surprisingly pleasant destination.

Yerevan, the Armenian capital, has a distinct Middle Eastern flavour, despite a monotonous Soviet cityscape. The international airport is not far from the city, in a valley surrounded by snow-capped mountains. It offers daily flights to Moscow and other international destinations.

All visitors from countries outside the former USSR require visas which, unlike those for some former Soviet republics, can be obtained quickly at any embassy for \$50. They cannot be issued at the airport.

At customs, fill out a currency declaration to ensure the hard currency brought in can be taken out again.

To avoid aggressive taxi drivers poised at the exit gate, hire a driver to meet you on arrival. This can be done through some hotels or through the service agency, Araz (see telephone numbers).

The capital's premier hotel, Armenia 1, sits in the town centre on Republic Square, known for colourful fountains where young Armenians gather nightly. Renovated five years ago by Yugoslav contractors, the hotel (\$100 per night) has spacious rooms, cable TV and supplies about four hours of hot water daily. A humming generator makes sure the lights usually work. A business centre downstairs has a fax machine and a reliable, if expensive, international ATT phone line.

The Hotel Armenia 2, just behind the marble halled Armenia 1, provides cheaper rooms (\$20 per night) with bone-chilling showers.

The only hotel to offer hot water 24 hours a day, the Hrazdan (\$75 per night) requires an official government invitation. Across Poronya Avenue from the Hrazdan, the Hotel Dvin (\$71 nightly) is the main alternative to Armenia 1, boasting relatively good facilities but a less central location.

Be aware, however, that hotels and restaurants in Yerevan do not accept credit cards. Bring enough cash.

Armenian cuisine can be sampled everywhere. Shash-

lyks and boiled lamb are the local specialties. Despite being popularly known as the "mafia restaurant", a good (and safe) bet is Dzoraghiugh, on Proshian Street, behind the St Sargis church. Waiters in traditional garb serve up grilled meats and fish. Bulgarian beer and Armenian wine for under \$20 per head. Female diners are presented with three roses at the meal's end, confining Caucasian chivalry and Soviet kitsch. (Women visitors note they would feel uncomfortable eating or travelling alone in Armenia.)

At the Armenia 1, two good restaurants plus a jazz club - where visiting businessmen often of Armenian descent. World Bank consultants and relief aid workers converge - can enliven a humid summer evening. The other hotels also have restaurants considered good by ex-Soviet standards.

After a few meals, however, Armenian cuisine can become tiresome. Alternatives are limited. The Krakow Bistro, adorned with pictures of the Polish city, offers Armenian-Polish fare in a comfortable setting across the Opera House Park, at 29A Tounmanian Street. The brave can try the

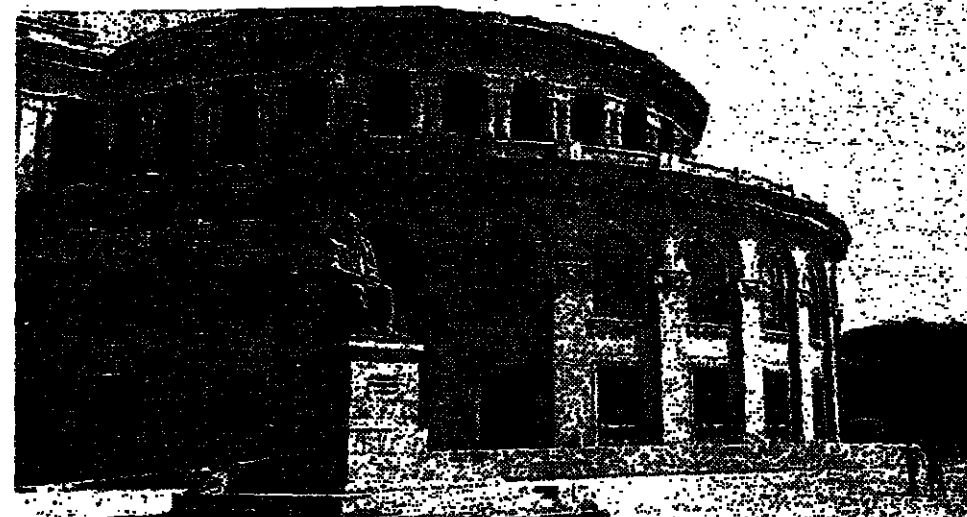


The Matenadaran museum, home to ancient manuscripts Edward Tenegean

local Tex-Mex alternative and pizzas at Mexican Dishes "777", also near the Opera.

If you want to sample the nightlife of Armenia's new economic elite, the Royal Club and Casino, at 32 Tigran Mets Street, might be worth a try.

Waiters and receptionists often speak limited English. Russian remains universally spoken: on the street and officially, its use is generally not frowned on. Signs for the main street use both Cyrillic and Armenian alphabets.



The Opera House: several Polish and Mexican-style restaurants are nearby Edward Tenegean

Casual dress is fine, particularly in the very hot summer months. But remember the country lies in the mountains and winter can be bitterly cold.

Armenians are very proud of their rich culture and history. Foreigners are often asked to visit the Matenadaran, which one writer called Armenia's Mecca. Here, more than 12,000 manuscripts from the ninth century on have been collected.

The main art gallery and history museum is on Republic Square.

A close-up look at Mount Ararat, at the Turkish border, just 30 minutes from Yerevan

by car, can be fitted in before a morning meeting. About 20km from Yerevan towards the airport, is Echmiadzin, seat of the Armenian Gregorian church, where a fourth-century cathedral can be explored.

Visitors required to spend the weekend should not despair. Try a day trip to Lake Sevan, an hour east. The Sevan monastery has good examples of Armenian hachkars, stone crosses found across the country, chiselled into the cliffs or church walls. In the south-east, among breathtaking mountain views, is a Greek-Roman style first century temple at Garni; nearby in Gerhard, a well-pre-

served church has been carved out of a cliff.

When leaving the "cradle of civilisation", the transition home can be eased at the airport VIP lounge (entry fee: \$10). Make sure to arrive early. A good bar and comfortable seats are essential if, as is often the case, your flight home is delayed.

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Armenia 1: 78852-525-883 (ATT
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Persecution has led to exodus. Haig Simonian on the diaspora

Emigrants remember roots

Armenians abroad have a funny reputation. George Orwell, recalling his days as a struggling kitchen hand in Paris, reflected on the veracity of the dictum "trust a snake before a Jew, a Jew before a Greek, but don't trust an Armenian".

Something of the same flavour comes from playwright, Friedrich Dürrenmatt. His work, *The Visit*, shows naturalised Armenian, Claire Zachanassian, guilefully getting revenge on a childhood assailant when returning to her home town.

Such characterisation arouses bitter-sweet feelings in Armenians abroad. Although fiercely proud of the commercial acumen and entrepreneurial skills that brought many from rags to riches in fewer than three generations, most would like to think of themselves as more than just cunning with the calculator.

Awkwardly, the popular

image of business brains is hard to shake off. Most of the 3.5m or so Armenians in the diaspora reached their present homes with little more than the clothes on their backs.

The trigger for the exodus was the genocide of 1915, when religious persecution and racial hatred fostered by pan-Turkism in the Ottoman empire, where most Armenians lived, spilled over into a blood-bath and led to mass deportations. More than a million are believed to have perished.

The lucky ones fled to start afresh elsewhere. Their usual destinations were neighbouring Middle East countries, such as Iran, Lebanon and Syria, with familiar cultures and climates, or significant powers further afield such as the US and France.

Sizeable Armenian communities already existed throughout the Middle East because of historical trade or religious links, and cities such as Beirut,

Aleppo, and Cairo had had Armenian districts for centuries. In Jerusalem, there is an Armenian quarter that dates from the early days of Christianity.

Trade also explained the existence of communities and centres of learning in the wider Mediterranean basin. Port cities such as Venice, Genoa and Marseilles boasted an Armenian presence long before the massacres.

Venice was the most active. It housed an Armenian boarding school and centre of learning, comprising libraries and printing presses. It also had the island of San Lazzaro, populated by a now dwindling order of Armenian monks.

But the diaspora stretched well beyond the Mediterranean. Visitors to Singapore often notice the small white Armenian church, increasingly incongruous amid the thrusting skyscrapers. Bombay, too, boasted a big Armenian community, built largely on the gold trade, while Isfahan in Iran was an important Armenian centre on the silk route.

Vienna is also an important Armenian seat of learning. And Manchester pre-dated London as the main Armenian centre in the UK because of the pull of the textiles trade.

By contrast, Armenian communities in the US and immigrant-hungry nations such as Canada and Australia tend to

be much younger. Unlike many of the older centres, such as Manchester, they are expanding, having been replenished by an influx from the traditional refugees of the Middle East.

In the past two decades, political instability in Lebanon, Iran, and, to a lesser extent, Cyprus, has led to a renewed Armenian exodus. The emigrants have been drawn to the existing large communities.

California (Los Angeles and the central valley); France (Paris and the Riviera); and the former Soviet Union (mainly Moscow) have large Armenia communities.

Each honours its favourite sons. California produced George Deukmedjian (a former Republican governor) and the billionaire deal maker, Kirk Kerkorian (whose father settled in Fresno to grow fruit). France has sprung a host of celebrities including Charles Aznavour and, the French Armenians claim, Edouard Beladur (born in Smyrna, Turkey, but raised in Marseilles).

The various waves of immigrants have generally integrated easily, although there has been occasional resentment on the part of older Armenians at the arrival of the "brasher" newcomers.

Meanwhile, the passage of time has led to a growing willingness to recognise racial identity, irrespective of political affiliations with the adoptive countries of Armenians in the diaspora.

That makes a sharp change from the mentality of many first-generation immigrants, whose priority was to remain inconspicuous and get on with creating a stable home and family and seeing to the children's education.

While these factors remain important today, younger Armenians, even from mixed marriages, are readier to speak their minds. This has helped attempts to quantify and learn more about the diaspora, creating a sense of cohesion. But the numbers remain

fuzzy in spite of all the efforts. Published estimates of the Armenian community in the UK, for instance, vary between 8,000 and 12,000. A figure of more than 600,000 is regularly quoted for the US. Numbers in France are impressive, but are believed to hover around the 100,000 mark.

Commerce and the professions are the preferred careers, with private business people, doctors, lawyers and accountants abundant. Music and other arts are also strongly represented.

Politicians, by contrast, are few and far between, although that may change as economic stability allows younger Armenians to shift their attention from their grandparents' emphasis on survival to wider horizons.

Despite so much diversity and the effects of intermarriage, the sense of racial identity has stuck. Languages and religions are the causes. Knowledge of Armenian, a mellifluous tongue with a unique script, has been a powerful binding force, although one that will inevitably decline through miscegenation.

By contrast, the role of the Church is as strong as ever. Its impact lies not in excessive religious zeal among the diaspora - most Armenians are

probably agnostic, limiting church-going to births, deaths and marriages, along with ritual visits at Christmas and Easter - but in its wider function as a symbol of national identity. Church-building has been a virtual obsession with Armenians abroad from the first immigrants. Holy Trinity in Manchester (financed by contributions of more than 22,500 from Armenian textile merchants in the 1860s); St Sarkis (funded by Nubar Gulbenkian, the oil magnate and one of two Armenian churches in London); Holy Virgin Mary (the new Armenian cathedral in Cyprus), or Forty Martyrs in Milan (founded by two Armenian brothers) are testaments to local Armenians' munificence.

Each one is a focal point and regular gatherings for cultural events, gossip or gastronomy keep the sense of community alive.

Church halls, or the "hey doon" (Armenian house) cultural centres in many big cities are magnets where Armenians gather to exchange news, look out for a future bride or show off a flashy new car. As long as the churches remain, Armenians in the diaspora are likely to retain their identities, whatever the pressures to the contrary.

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COMMODITIES AND AGRICULTURE

Price volatility turns can maker against aluminium

By Kenneth Gooding, Mining Correspondent

Continental Can Europe is likely to switch the raw material used in its two beverage can-making plants in the UK back from aluminium to steel, the company is believed to be planning. The move, which would be the first to make this move, although other can and beverage producers have been threatening similar action.

Their protests followed a steep rise in aluminium's price and subsequent increase in the price of can sheet, a special alloy used for beverage cans, at the start of this year by more than 50 per cent in the US and by nearly 20 per cent in Europe.

Continental Can's move will

raise some eyebrows because the company is ultimately owned by Viag, the German group that has an aluminium-producing subsidiary in VAW but no steel production.

A Continental Can official in Düsseldorf said yesterday that the beverage can making plant at Wrexham in the UK would be switched from aluminium to steel during the second half of this year as a "defensive" move. The company was concerned about the volatility of aluminium's price compared to that of steel which, although also moving up, was doing so gradually.

The company has another UK beverage can making plant, at Rugby, which will continue to use aluminium. Each UK

plant produces about 1.5bn cans a year.

Ironically, Continental Can last month started production at a new DM80m (US\$) beverage can plant in Radomsko, Poland, which uses aluminium to produce 450m cans a year. This will be more than enough for present Polish demand and the plant will export to countries in central and eastern Europe. The company has earmarked another DM80m to increase annual capacity in Poland to 1bn cans.

The Continental Can official said that most of the company's ten beverage can plants - in Belgium, France, Germany, and the Netherlands as well as Poland and the UK - used steel.

'Two big "players" controlling tin stock'

By Kenneth Gooding

Most of the tin in London Metal Exchange warehouses is controlled by two big "players" and this accounts for the present tightness in supplies for immediate delivery, some traders suggest.

This tightness is reflected in a substantial backwardation, or premium for immediate delivery, on the LME. By the close last night the backwardation between cash and three-month tin had widened from US\$75 to \$93 a tonne.

Mr David King, LME chief executive, insisted this was not a cause for concern, but said the exchange was monitoring the situation more closely than usual, as it always did when there was a backwardation. The LME executive could intervene if it suspected that the market was being manipulated in an undesirable way.

One theory supported by some traders, is that a big tin producer is holding stock to protect the position as it sells forward to keep the forward price down. This is because of worries about consumers substituting other metals in some applications should tin rise too far too fast.

Mr Wiktor Bielski, analyst at Balm Securities, a Deutsche Bank subsidiary, pointed out that very little tin was available for immediate delivery because of a sharp fall in exports from China. These were at present down to an annualised rate of 25,000 tonnes compared with more than 44,000 tonnes in 1994. So the deficit might reach 15,000 to 20,000 tonnes this year, which would reduce total stocks to below nine weeks' consumption, from 15 weeks at the end of 1994.

The tin price could be expected to top \$3 a pound (\$6.12 a tonne) soon and reach a peak of \$3.20 to \$3.50 after that, Mr Bielski predicted.

Strong recovery seen in Australian grain harvest after 1994-95 drought

By Nikki Tait in Sydney

Australian grain farmers should see a substantial recovery in crop production during 1995-96 after the previous growing season's disastrous, drought-depressed decline, according to the Australian Bureau of Agricultural and Resource Economics.

Abare, a federal government-owned research agency, forecast yesterday that wheat production should total around 16.04m tonnes, up from just over 9m tonnes in 1994-95, and

similar to levels seen in the two preceding years. It said the area sown to winter wheat was expected to rise "mainly reflecting a recovery from drought-reduced plantings in 1994-95, but also reflecting rising world prices as a result of wet weather in the US and Canada".

The bureau warned, however, that "despite some good rains in many parts of Queensland, the run of poor seasons has made farmers wary of rapidly expanding the areas planted to winter crops".

"Good follow-up rains are required during June before the expected area will be sown. If this occurs there could be around 1m hectares of winter crops sown in Queensland in 1995-96," it said. Queensland has been the state worst affected by the recent drought conditions - blamed on the "El Niño" climate pattern - although New South Wales and Victoria have also been badly hit. Wheat production in Queensland was just 22,000 tonnes last year, against the 1m tonnes produced in an average year.

The total area planted to winter crops in the 1995-96 season was forecast to be 16.8m hectares, up 18 per cent on the previous year, with the area planted to cereal, pulses and oilseeds expected to expand in all states except South Australia. Abare also predicted that cashflow needs would also encourage farmers to boost cropping before expanding livestock interests - simply because cropping income would be received more quickly.

Sugar growers expect lower production

By Nikki Tait

Queensland cane growers have warned that raw sugar production in Australia is likely to dip from last year's record level, largely as a result of continuing drought conditions in some parts of the state. Queensland is the country's

main sugar-cane growing state, and a major supplier of raw sugar exports on world markets.

"Queensland's cane growing regions, particularly Bundaberg and Mackay, experienced one of the driest growing seasons on record in 1994-95 and these unfavourable sea-

sonal conditions are expected to result in slightly reduced tonnages and lower sugar content in cane," said the Queensland Sugar Corporation this week.

Preliminary estimates, just ahead of this year's crushing season, suggest that just over 4.55m tonnes are likely to be

produced, down from 4.68m tonnes in 1994. However, returns to growers will be dentured further by lower world prices, as increased production from Brazil, India and Thailand is expected to lift world production above consumption for the first time in three seasons.

'Smelters to maintain output cuts'

By Kenneth Gooding

Big aluminium producers are likely to wait until the end of this year before re-starting capacity shut down following the "massive" downturn in aluminium prices reached by the metal in 1993, suggests Rudolf Wolf, the commodity broker and part of Noranda, Canada's natural resources group.

This view was given extra weight yesterday as a number of producers insisted they had no plans yet to re-start capacity. Alcan of Canada at first sight seemed to have broken ranks with an announcement that it was to re-start a 28,000 tonnes a year line at its Aratu smelter in Brazil by the end of September.

However, Mr Jacques Bou-

Aluminium	Aluminium alloy	Copper	Lead	Nickel	Zinc	Tin
5,500	10,000	10,000	10,000	10,000	10,000	10,000
1,500	1,500	1,500	1,500	1,500	1,500	1,500
1,500	1,500	1,500	1,500	1,500	1,500	1,500
1,500	1,500	1,500	1,500	1,500	1,500	1,500
1,500	1,500	1,500	1,500	1,500	1,500	1,500
1,500	1,500	1,500	1,500	1,500	1,500	1,500

and any pick-up in production too soon would once again increase the overburden of stocks which the memorandum was designed to reduce.

The market was nervously concentrating on the withdrawal of the investment funds from the aluminium market and the expected re-start of capacity.

"Once the anticipated production increases actually come on stream this inhibiting factor will be out of the way and the market can begin to focus on the comparatively neglected consumption growth and the limited amount of new smelter capacity currently scheduled," Mr Squires added.

Wolf expected the aluminium market to have a supply deficit "for at least the next couple of years".

MARKET REPORT London cocoa futures down sharply

London Commodity Exchange COCOA futures prices ended sharply lower yesterday after a speculator-led sell off pushed contracts to some of the lowest levels in a year and a half.

Traders attributed the change in sentiment to the failure of last week's rally attempt. The September position ended down £24 at £941 a tonne.

COFFEE futures were also

weak early on but recouped some of their losses towards the close as speculators, who had been light sellers, jumped back into the market. Compiled from Reuters

COMMODITIES PRICES

BASE METALS

LONDON METAL EXCHANGE

(Prices from Ammetmet Metal Trading)

ALUMINIUM, 99.7% Purity (per tonne)

Cash 3 mths.

Close 1785.5-5.5 1779-80

Previous 1787-7

High/Low 1785-5.5 1779-7.5

AM Official 1785.5-5.5 1779-7.5

Karb close 1785.5-5.5 1779-7.5

Open Int. 193,891

Total daily turnover 42,404

ALUMINIUM ALLOY (per tonne)

Close 1940-50 1855-60

Previous 1940-50 1855-60

High/Low 1940-50 1855-60

AM Official 1940-50 1855-60

Karb close 1940-50 1855-60

Open Int. 2,549

Total daily turnover 180

LEAD (per tonne)

Close 593.5-4.5 606-7

Previous 593.5-4.5 606-7

High/Low 593.5-4.5 606-7

AM Official 593.5-4.5 606-7

Karb close 593.5-4.5 606-7

Open Int. 30,951

Total daily turnover 4,904

NICKEL (per tonne)

Close 7785-80 7890-94

Previous 7785-80 7890-94

High/Low 7785-80 7890-94

AM Official 7785-80 7890-94

Karb close 7785-80 7890-94

Open Int. 48,307

Total daily turnover 12,303

TIN (per tonne)

Close 6390-45 6245-50

Previous 6390-45 6245-50

High/Low 6390-45 6245-50

AM Official 6390-45 6245-50

Karb close 6390-45 6245-50

Open Int. 86,338

Total daily turnover 21,152

COPPER, grade A (per tonne)

Close 2881-82 2887-88

Previous 2881-82 2887-88

High/Low 2881-82 2887-88

AM Official 2881-82 2887-88

Karb close 2881-82 2887-88

Open Int. 28,925

Total daily turnover 6,806

AM Official 2881-82 2887-88

Karb close 2881-82 2887-88

Open Int. 28,925

Total daily turnover 6,806

AM Official 2881-82 2887-88

Karb close 2881-82 2887-88

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Total daily turnover 6,806

AM Official 2881-82 2887-88

Karb close 2881-82 2887-88

INTERNATIONAL CAPITAL MARKETS

US Treasuries volatile in early trading

By Lisa Branson in New York
and Conner Middelmann
in London

US Treasury prices were volatile throughout the morning yesterday as the market continued to come to terms with the sharp rally staged at the end of last week.

Bonds opened lower in New York on the heels of profit-taking in Europe, but later recovered as Mr Robert Parry, president of the Federal Reserve Bank of San Francisco, said he believed the economic slowdown had "intensified."

By midday the benchmark 30-year Treasury was trading 11 1/4% to yield 8.50%.

At the short end of the maturity spectrum, the two-year note was 10 1/4%, yielding 5.50% per cent.

Immediately after Mr Parry's comments, the long-bond jumped by half a point, only to

post a retreat as investors took some profits out of the market.

A Commerce Department report that wholesale inventories rose a seasonally adjusted 1.2 per cent in April was seen as good news for bonds because it suggests production may be lower in the second quarter as there is sufficient inventory to meet demand.

A stronger dollar also offered some support to bonds. By midday the US currency was trading at DM1.4185 and ¥85.05 compared with DM1.4105 and ¥84.90 late on Monday.

The yield curve that maps the yield spread between two-year notes and the long-bond flattened modestly. Near noon the spread was at 95 basis points compared with 98 points late on Monday.

European markets saw another day of gains, buoyed by investor buying on interest

rate optimism and continued US Treasury strength.

Amid widespread bond-positive sentiment, Europe's higher-yielding markets have started to catch up with their core counterparts. "If there's a sustained period of currency stability, you could see some investors hunting around for higher yields in Europe," said one trader.

GOVERNMENT BONDS

Among the peripheral markets, Swedish bonds put on a strong performance after the central bank raised its repo-rate by 25 basis points to 8.65 per cent, causing their yield spread over German bunds to narrow to 368 basis points from 379 points. The market gained extra support from the krona's strength.

Italy and Spain also posted strong gains, underpinned in part by their currencies' resilience against the D-Mark. In Spain, prices rose sharply in futures-driven trading, with the June 10-year bond future up 0.68 at 88.95. Italy's BTPT future gained 0.28 to 101.75.

German bunds made healthy gains on the back of US Treasuries, although trading was dominated by roll-over activity from the June into the September bond futures contract.

The Bundesbank's allocation of two-week repos will be closely watched for clues on the near-term direction of interest rates. Traders in Germany were cautious about the chances of a significant reduction from last week's 4.51 per cent rate, some London dealers were hoping for a sharper decrease, signalling an early end in the discount rate.

UK gilts tracked US Treasuries higher in quiet trading. An early dip in prices triggered healthy investor buying, signalling that the market continues to have a solid base. Dealers are now looking to test the market's industrial production data for evidence on whether the US soft landing has spilled over to the UK.

The State Bank of Vietnam has opened a Treasury bill market, and will hold the first domestic T-bill auction on Thursday, Reuters reports.

Six-month bills totalling 600m dong (85,430m) in denominations of 10m dong, 5m dong, 2m dong and 1m dong will be offered at the auction, officials at the central bank said, adding that 32 financial institutions, including three joint-venture banks and four foreign bank branches, had registered as full members of the market.

Further gilt reforms in prospect, says Bank

By Richard Lapper

The Bank of England yesterday signalled further possible reforms of the UK government bond market, indicating that gilt repos might be used in its broader money market operations.

Mr Ian Fenderleith, executive director, also hinted at the further development of the index-linked market, during a speech to a London conference on gilt repos.

Gilt repos, to be introduced next January, are one of a number of reforms designed to make the market more efficient and attractive. Mr Fenderleith said their introduction entailed a "sea change in the structure of the market".

Other changes announced recently include a programme of structural auctions and tax changes, paving the way for a market in gilt strips.

Coupled with imminent changes to settlement and supervisory procedures, the introduction of repos is "likely to bring a greater fusion between the sterling money and bond markets... which are inherently parts of a single continuum across the maturity spectrum," he said.

Gilt repos will introduce a new secured money market instrument which will be closely monitored. While the Bank has no plans to change the form of its money market operations, the development of repos "could make it sensible for the Bank to contemplate changes in its operations in due course".

Mr Fenderleith said that as interest in index-linked stock deepened and other countries adopted similar programmes, the Bank would "consider whether any adaptations are needed in our index-linked market to meet evolving needs."

Lehman in offer for collared FRNs

By Antonia Sharpe

Lehman Brothers will announce a tender offer today for any or all securities from 67 issues of collared floating-rate notes, worth about \$80m.

This is the largest tender of its kind in Europe and follows offers for structured notes launched recently in the US.

Lehman intends to accumulate these issues and repurchase them into ordinary FRNs, which will then be sold in larger and more liquid units to institutional investors. It declined to say how many notes it expects to buy during the tender period, which is due to close on June 20.

The market in collared FRNs, which differ from ordinary FRNs in that they have minimum and maximum coupons, took off in the summer of 1992 when interest rates were falling. They appealed in particular to European retail investors who were keen to enhance their returns.

In many cases, the floor, or minimum coupon, on the notes was 5 per cent when money market rates were more than 1 1/2 points lower.

However, the value of collared FRNs dropped in early 1994 when the US Federal Reserve raised interest rates, bringing an end to the bull run in the bond markets. The change in the interest rate environment took away the main attraction of the notes. Many of these notes, which were issued at par, are now quoted in the low to mid-40s but they are difficult to trade.

Mr Andrew Pisker, head of Lehman's fixed income new issues and credit business in Europe, said many retail investors wanting to sell their small positions in collared FRNs had been unable to get an attractive price. "A public transaction, such as a tender offer, provides a very efficient and transparent alternative for those investors who want to sell their holdings," he said.

IFC plans to securitise \$400m worth of loans

By Antonia Sharpe

The International Finance Corporation, the World Bank's private sector finance arm, intends to securitise \$400m of its loans to privately-owned companies in 11 developing countries.

Mr Jamnik Lindbeck, executive vice-president of the IFC, said the pilot transaction would increase its capacity to invest in developing countries by freeing capital on its balance sheet. It would also mobilise private sector investment from institutions active in the asset-backed market that had not invested previously in developing countries.

The IFC will pool a group of its senior loans to 73 private

companies in Asia and Latin America, and sell participation interests in the loans to an offshore trust. The trust will finance the acquisition through a public offering of floating-rate certificates.

The deal is expected to be launched in the next few weeks. CS First Boston, which advised the IFC, will be lead manager and Deutsche Bank and UBS co-managers.

If the deal is successful, the IFC is likely to consider securitising more of its loans. Its outstanding loan portfolio totals \$5.7bn, of which \$1.4bn is in Latin America and \$760m in Asia. The transaction could also encourage other multilateral agencies to securitise loans.

L-Bank global offering set to dominate activity

By Antonia Sharpe

L-Bank is expected to dominate activity today with the launch of its global bond offering, which could be as large as DM2bn.

The issue, via Dresdner Bank and Morgan Stanley, will have a 10-year maturity and the pricing is likely to be about 30 basis points over German gov-

INTERNATIONAL BONDS

ernment bonds. The deal will probably have been launched overnight in Asia to give momentum to trading in Europe and the US.

Yesterday, the primary market was lively with deals coming in dollars, yen, D-Marks and even escudos. Unusually, many of the offerings seemed to be correctly priced.

A \$250m five-year offering from NTT of Japan was snapped up by a broad range of

investors. Lead managers Merrill Lynch and SBC said the deal sold quickly because of the issuer's rarity value, the scarcity of five-year eurodollar paper and the 6 per cent coupon, which was attractive to retail investors.

The bonds were priced to yield 10 1/2 basis points over Treasuries at launch but ended the day at 17 points over.

NTT's deal caused the \$300m three-year offering for Toyota to get off to a slow start but the spread on the bonds tightened slightly from 15 basis points over Treasuries to 14 points when syndicate broke.

The \$300m five-year floating-rate note for Dean Witter Discover was also regarded as successful due to its realistic pricing and extensive pre-marketing. Several recent FRNs have been aggressively priced.

Other US issuers are looking at the eurobond market because spreads have widened at home. Several houses sub-

NEW INTERNATIONAL BOND ISSUES

Borrower	Amount	Coupon	Price	Maturity	Yield	Spread	Book runner
US DOLLARS							
Dean Witter Discover & Co.	300	6.75	99.88R	Jun 2000	0.25R	+105bp (4-5)	Morgan Stanley & Co. Inst.
Toyota Motor Credit Corp.	300	5.875	100.01R	Jun 1998	0.185R	+105bp (4-5)	Merrill Lynch International
NTT	250	8.00	99.85R	Jun 2000	0.25R	+105bp (4-5)	Merrill Lynch
Chemical Banking Group	300	6.00	99.93R	Jul 2000	0.175R	+105bp (4-5)	Chemical Investment Bank
YEN							
Esportfinans	500m	2.65	100.10R	Jul 2002	0.30R	-	Fuji Int'l/Yamachi Int'l
D-MARKS							
Caixal Local de France	500	5.875	99.80R	Jul 2000	0.25R	+306bp (4-5)	ABN Amro/Tinkus
Schwabach LB Capital	500	5.625	99.80R	Jul 1999	0.225R	+206bp (4-5)	SBC
Oesterreichische Postsparkasse	300	5.75	99.80R	Jul 2000	0.25R	+236bp (4-5)	CSFB-Effektbank
SWISS FRANCES							
Oesterreichische Postsparkasse	100	5.00	103.85	Jul 2005	2.75	-	UBS
ESCUROS							
Official Credit Institution	200m	(dfl)	100.00	Jul 2000	undist.	-	BSN Portugal

Final terms, non-callable unless stated. Yield spread over relevant government bond at launch supplied by lead manager. *Inflated; †Floating-rate note. R: Bond not yet priced; price shown at re-offer level. 4: 3-mth Libor -0.20; by 3-mth Libor +0.20; by 3-mth Libor +0.20; by 3-mth Libor +0.20.

mitted bids yesterday to Xerox, which is believed to be considering a \$200m five-year fixed-rate offering. The company might have to pay a spread of about 45 basis points over Treasuries because of its single A rating.

Norway's Eksportfinans joined the stream of issuers

debt bank loans, incorporating the value of collateral and other protective features provided to lenders by corporate borrowers, writes Conner Middelmann. The scale is intended to facilitate loan trading, enhance borrowers' access to capital and offer lenders a new way to evaluate their exposure.

FT-ACTUARIES FIXED INTEREST INDICES

Index	Jun 6	Jun 5	Jun 4	Jun 3	Jun 2	Jun 1	May 31	May 30	May 29
1-5 years (25)	122.83	-0.02	122.80	2.38	4.27	5 yrs	7.43	7.43	7.43
2-5 years (21)	147.98	-0.07	147.98	2.12	5.44	15 yrs	7.77	7.78	7.78
5-15 years (28)	148.68	-0.04	148.68	2.04	6.88	20 yrs	8.78	8.78	8.78
4-Intermediate (13)	191.34	-0.12	191.11	1.22	6.38	Int'l	7.65	7.65	7.65
5 All stocks (58)	143.76	-0.05	143.69	2.21	5.16				

Index-linked
1-5 years (25) 196.15 -0.04 196.07 0.92 2.57 Up to 5 yrs 2.98 2.98 3.78 1.46 1.47 2.81
2-5 years (21) 187.90 -0.15 187.75 1.73 Over 5 yrs 3.51 3.52 3.80 3.33 3.33 3.82
5 All stocks (113) 187.90 -0.14 187.65 1.30 1.81

Average gross redemption rates are shown above. Coupon Bands: Low: 0%-10%; Medium: 0%-10%; High: 11% and over. † Flat yield, yield to date.

FT FIXED INTEREST INDICES

Index	Jun 6	Jun 5	Jun 4	Jun 3	Jun 2	Jun 1	May 31	May 30	May 29
Govt. Secs. (UK)	95.20	95.51	95.24	94.91	94.31	92.82	95.51	90.22	
Fixed interest	114.54	114.80	113.98	113.55	113.85	110.76	114.64	108.77	

† For 1995, Government Securities high prices completed: 127.42 (9/1/94), Low 49.18 (9/1/78). Fixed interest high prices completed: 133.87 (2/1/94), Low 50.53 (2/1/78). Basis: 100 Government Securities 1970/76 and Fixed interest 1983. See activity indices below 10/74.

FT/ISMA INTERNATIONAL BOND SERVICE

Listed are the latest international bonds for which there is an adequate secondary market. Latest prices at 7:00 pm on June 6

Issued	Bid	Offer	Chg.	Yield	Issued	Bid	Offer	Chg.	Yield
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US DOLLAR TREASURY 5 1/2% 1000 95 94 1/2 5.88

Abbey Nat Treasury 5 1/2% 1000 94 93 1/2 5.82

Alberca Prov 7 1/2% 500 104 103 1/2 7.27

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INVESTMENT TRUSTS - Cont.

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INVESTMENT COMPANIES - Cont.**OIL EXPLORATION & PRODUCTION - Cont.****PROPERTY**

SPIRITS, WINES & CIDERS

TRANSPORT - Cont

WATER

SUPPORT SERVICES

AMERICANS

CANADIANS

P/E SOUTH AFRICANS

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GUERNSEY (REGULATED)()**

Index	Index	Selling	Buying	Net	Index	Index	Selling	Buying	Net
Price	Price	Price	Price	Price	Price	Price	Price	Price	Price
Fidelity Money Funds					ANZ Investment Co (Germany) Ltd				
Capital Fund, Philadelphia, Bermuda					Long Term Bond	131.1	132.0	1	
US Fed Advisors (001 41481)					Apollo Investment Management Ltd				
Prime Cash (001 41412)					US Government	112.0	113.0	1	
From Prime (041 7727727)					Bank of America (Germany) Ltd				
					International Fund Ltd				
Capital Fund					Long Term Bond	111.5	112.5	1	
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Lazard J&P Bepco	31.00	17.04	=
Lazard J&P Bepco	325.99	27.82	=
Lazard Freres Asset Management (CF) Ltd			

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IRELAND (REGULATED))**

[illegible]

UK Gm. & Pst. Fr.	107.25	107.25
Order Deposit	51.9748	51.9748
Starting Deposit	57.28	57.28
Minimum Currency	112.50	112.50

[illegible]

FD Box 503, St Heller, Jersey City	07534 07
Starting Bond _____ 3	89.382nd 9.701 -0.01C
Starting Cap _____	448.33

[illegible]

Const. Capital Builder... 21,314
 Soil Growth & Income... 24,252
 International Bank... 22,297

Democratbank Asset Management SA (a)

[illegible]

European Equity	EUR 1.28	+0.02
Nordic Equity	EUR 14.57	+0.03
Asian Equity Portfolio	EUR 4.57	+0.07
Asian Equity Portfolio	EUR 4.16	+0.08

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● FT Cityline Unit Trust Prices are available over the telephone. Call the FT Cityline Help Desk on (+44 171) 573 4378 for more details.

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LONDON STOCK EXCHANGE

MARKET REPORT

Late run sees Footsie move further ahead

By Steve Thompson, UK Stock Market Editor

There was no stopping the "feel good" factor in the UK equity market yesterday as share prices edged further ahead. The market overcame its nervousness ahead of today's meeting between Mr Eddie George, governor of the Bank of England, and Mr Kenneth Clarke, chancellor of the exchequer.

The FT-SE 100 Index climbed 3.4 to 3,380.0, its fifth straight gain. The FT-SE Mid 250 Index, meanwhile, penetrated the 3,700 level for the first time since last September, ending a net 10.8 higher at 3,700.5.

250's performance came from the strong showing by many of the regional electricity stocks, after Seaboard's bumper dividend payout, plus a sprinkling of good gains among the property shares.

In the background, Wall Street gave European markets a fresh boost in mid-afternoon when the Dow Industrial Average responded to a fresh burst of buying interest on Wall Street, while gilts more than regained early small losses.

Marketmakers were at odds over the market's short term prospects after its recent splendid run. One of the senior marketmakers at a leading European bank said London would continue to outperform if

Wall Street held firm. "London is underpinned by a strong earnings and dividend profile and the prospect of bids," he added.

Another took an opposite view, insisting that Wall Street's volatility was the indicator of an impending sharp fall by US equities and across Europe.

At some of the big UK securities houses, the feeling was that market-makers are becoming increasingly short of stock and would like to see a sharp retracement in the market, if only to allow them to replenish trading books.

On the analytical side, one strategist maintained that there was still scope for another half-point reduction in gilt yields but that now would be an opportune moment to switch from gilts to equities.

The FT-SE 100 began the session in good form, and almost eight points higher in the wake of Wall Street's move to another record.

However, a sluggish gilt market and small pockets of profit-taking took the edge off the market and drove the leading index down to a session's low of 3,368.8 in mid-morning, although dealers said the sell-off was mostly triggered by pressure in the futures market.

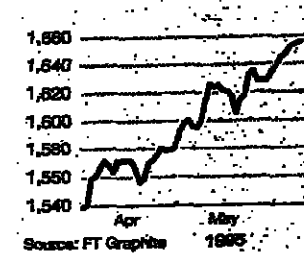
With the Dow opening on a strong note, the UK equity market gathered itself to close comfortably in the black.

Seaboard kicked off the regional electricity sector's preliminary reporting season, pleasing the market with a better than expected 23 per cent dividend increase and the promise of more to come. The rest of the sector moved in tandem.

Maiden results from Camelot, which runs the UK national lottery, were not quite as good as expected and that, plus disappointing preliminary figures, affected sentiment in shares of two Camelot participants, De La Rue and Rascal Electronics.

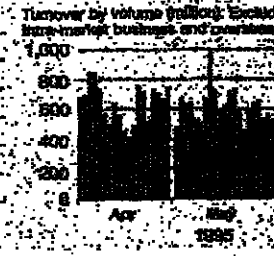
Turnover picked up to reach 633.5m shares, with non-Footsie issues accounting for only 5.5 per cent of the total. Retail business on Monday was worth £1.06bn.

FT-SE-A All-Share Index



Source: FT Graphs

Equity shares traded



Turnover by volume (million shares)

Source: FT Graphs

Indices and ratios

FT-SE 100	3380.0	+3.4
FT-SE Mid 250	3700.5	+10.8
FT-SE-A All-Share	1658.74	+2.7
FT-SE-A All-Share yield	3.91	(3.91)

Best performing sectors

1 Electricity	+1.1
2 Tobacco	+1.0
3 Telecommunications	+0.8
4 Utilities	+0.5
5 Pharmaceuticals	+0.5

Worst performing sectors

1 Other Services & Bus	-1.2
2 Paper, Pkg & Print	-0.7
3 Retailers, Food	-0.7
4 Building & Construct	-0.5
5 Textiles & Apparel	-0.5

FUTURES AND OPTIONS

FT-SE 100 INDEX FUTURES (LIFE) 25 per full index point (A/F)									
	Open	Set price	Change	High	Low	Est. vol	Open int.		
Jun	3384.0	3388.0	+7.0	3393.0	3370.0	158	2426		
Jul	3407.5	3411.5	+7.0	3416.0	3398.5	4619	1789		
Aug						0	382		

FT-SE MID 250 INDEX FUTURES (LIFE) 25 per full index point									
	Open	Set price	Change	High	Low	Est. vol	Open int.		
Jun	3705.0	3711.0	+11.0	3711.0	3705.0	198	2426		
Jul	3710.0	3716.0	+11.0	3716.0	3710.0	198	2426		
Aug						0	382		

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EURO STYLE FT-SE 100 INDEX OPTION (LIFE) 25 per full index point									
	Open	Set price	Change	High	Low	Est. vol	Open int.		
Jun	3384.0	3388.0	+7.0	3393.0	3370.0	158	2426		
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WORLD STOCK MARKETS

INDICES

	Jun 6	Jun 5	Jun 2	High	Low
Argentina (ASX100)	1585.54	1570.25	1568.10	2/1	951.10 9/5
Australia (ASX100)	2220.1	2011.7	2038.7	2077.00	194
Autralia (ASX100)	678.9	677.3	677.3	678.00	194
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AMERICA

Dow mixed as bonds fail to give impetus

Wall Street

US shares were mixed in early afternoon trading as neither the bond market nor any piece of important economic data helped traders to establish a clear direction, writes Lisa Branstetter in New York.

At 1 pm the Dow Jones Industrial Average was 6.22 higher at 4,482.77, while the more broadly based Standard & Poor's 500 gained 0.19 at 336.78. The American Stock Exchange composite eased 0.88 to 487.83 and the Nasdaq composite slipped 1.08 to 881.79. Volume on the New York SE came to 206m shares.

The bond market was volatile throughout the day as traders took profits each time prices pushed higher. By midday the benchmark 30-year bond was up nearly a quarter of a point to yield 6.01 at 101.14, while the two-year note slid 4 to yield 5.50.

The Nasdaq composite posted a modest retreat on the heels of the strong gains it made on Monday after IBM announced that it was launching a hostile bid to purchase Nasdaq-traded Lotus Development for \$3.3bn, or \$80 per share.

Lotus Development added 8% to the near \$29 it rose on Monday, bringing the share price to \$61.18, as speculation increased that another bidder might emerge to top IBM's offer. IBM recovered 6% of the 8% it shed on Monday, bringing the price to \$91.

Elsewhere on the Nasdaq, Qualcomm jumped 14 per cent or \$4.40 to \$33.40 on news that PCS PrimCo would distribute the technology for the wireless communications company through its planned network. Shares in the company were up \$1.10 on Monday after NEC, of Japan, said it had licensed Qualcomm's wireless technology for use in building infrastructure for cellular telephone networks.

Canada

Toronto rose in morning trade, although gains in most sectors were offset by weak previous metal issues. The TSE-300 Composite index was 5.81 higher at noon at 4,469.30 in heavy volume of 40.6m shares.

John Labatt jumped 3.2% to C\$27.75, as the directors agreed to recommend a C\$23.50 a share "white knight" takeover bid from Interbrew, the privately held Belgian beermaker, in a merger that will create the world's third largest brewing group. Labatt had been seeking alternatives to a hostile C\$24 a share bid from Onex, the leveraged buyout group.

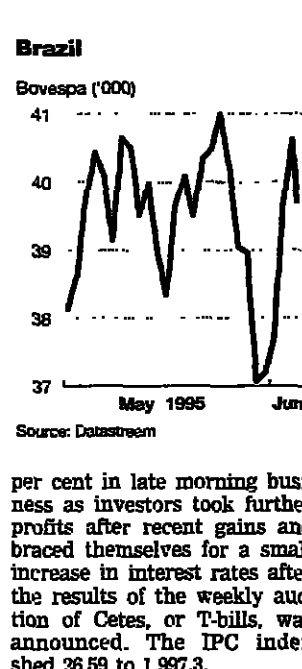
Brazil gives up 2.3%

São Paulo fell 2.3 per cent in light midday trading on profit-taking and speculative selling ahead of the mid-June index and options settlements. The Bovespa index was 925 lower at 29,703 at 1 pm in turnover of R\$155.8m (\$17.4m).

Analysts noted that the market had rallied by 9 per cent over the previous four sessions as optimism grew over key congressional votes, scheduled for late yesterday and today, on proposals to break the telecommunications and oil monopolies.

BUENOS AIRES tumbled 4.1 per cent in late morning trade on the heels of new government austerity measures. The Merval index lost 18.36 at 428.18 as analysts commented that the market reflected the weak macroeconomic situation which was forcing the Argentine government to further tighten public finances.

MEXICO CITY declined 1.3



EUROPE

Continent remains stuck in post-holiday mood

After a holiday on Monday, most of the major markets remained in a subdued mood.

PARIS weakened slightly as profits were taken in a number of issues after recent gains, while dividend payments in a few major blue chips also dragged the index lower.

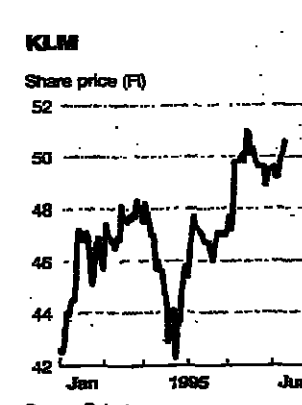
The CAC-40 index retreated 5.38 to 1,865.94 in turnover of FF3.2bn.

LVMH lost FF21 at FF931 as it denied reports that it might either purchase a French newspaper group or issue a convertible bond.

Banks and insurers went against the trend as expectations for lower interest rates in the near term gained ground while they were also supported by bonds. Credit Lyonnais, close to finalising the sale of its MGM chain, climbed FF11.90 to FF289.90, while Bancaire par to FF18.45 at FF583 and Axa FF8.20 at FF273.20.

Suez, up FF2.80 at FF283.90, denied speculation that it might merge with BNP and UAP, up FF3.60 and 90 centimes respectively to FF54.50 and FF44.90.

FRANKFURT reflected dollar strength which brought the Dax index to a floor trading



close of 2,146.40, up 10.14. The Dax index settled at 2,153.76.

In banks, Deutsche gained DM1.40 at DM71.50, Dresdner DM0.40 at DM40.40 and Commerzbank DM2.50 at DM339.50.

Chemicals went in the opposite direction. Bayer lost DM1.70 at DM346.30, BASF DM1 at DM306 and Hoechst 50 pfennings at DM311.

Among vehicle manufacturers, Daimler-Benz made DM3.50 at DM701, BMW rose DM4 to DM784.50 and Volkswagen was up 50 pfennings at DM402.

ZURICH edged ahead, the SMI index firming 4.4 to 2,808.7, as financials led the market forward on hopes for lower interest rates.

Among insurers, Zurich bearers rose SF31 to SF1,429 and Swiss Re registered were up SF27 to SF325, supported by a buy recommendation from Credit Suisse. CS Holding bearers, trading ex-dividend, firmed SF10 to SF526.

Nestlé, another ex-dividend stock, picked up SF6 to SF17.15 in active trade.

Harris added SF3 at SF507 as the takeover commission postponed its decision on BBA's agreed offer.

Other second-liners were mixed, with Ascom shedding

FT-SE Actuaries Share Indices

Hourly changes	Open	10.30	11.00	12.00	13.00	14.00	15.00	Close
FT-SE Actuaries 100	1382.82	1383.70	1383.23	1381.28	1381.78	1379.25	1376.82	1377.53
FT-SE Actuaries 200	1457.94	1458.79	1458.51	1458.73	1458.24	1456.01	1453.14	1453.48

FI 537m, while the shares also received impetus from hopes that the dispute with pilots would be concluded soon.

Profit-taking continued to gain away at Royal Dutch, off F12.60 at F128.10, and following an analysts presentation last week.

MILAN edged higher, in another restrained session with only Fiat and the banking sector demonstrating signs of life. The Comit index rose 4.34 to 630.00, while the real-time Mibtel index finished 25 higher at 10,077.

Fiat fell 1.72 to L6,223 in further response to Friday's lower than expected first quarter operating margins. James Capel, which downgraded the stock, cited the previous strong performance of the shares; technical analysis that suggested the upward share

ASIA PACIFIC

Nikkei drops 1.5% on pessimism over bank bail-outs

Individual investors took profits on speculative issues. Maruyama, the day's most active stock slipped Y9 to Y85 and Tannura Electric Works Y50 to Y1,040. Daido Steel Sheet, however, moved forward Y20 to Y960.

Steels were lower on foreign selling. Nippon Steel eased Y5 to Y904 and NKK Y1 to Y212.

In Osaka, the OSE average declined 141.62 to 16,886.66 in volume of 8m shares. High-technology stocks and pharmaceuticals were sold. Rohm, a semiconductor device maker, receded Y80 to Y3,940.

Roundup

Profit-taking was much in evidence in regional markets yesterday when Seoul was closed for the Memorial Day holiday. MANILA, however, ended at its second successive 1995 closing high, supported by overnight gains on Wall Street.

The composite index added 36.79 or 1.3 per cent at 2,877.33, off an intraday peak of 2,886.43, in volume of 1.6bn shares worth 1.95bn pesos.

Brokers said some stocks had now reached overbought levels but that foreign demand continued to sustain a rise.

Gainers included PLDT, 1.3 per cent stronger at 1,880 pesos, and Petron, up 2.3 per cent at 23.25 pesos.

KUALA LUMPUR ended lower after profit-taking reversed a firm opening as institutions, which had been accumulating blue chips, decided to book profits to buy leading second and third line stocks.

The composite index, which closed at new highs for the year in the previous two sessions, lost 4.53 at 1,080.52.

Financials led falls in blue chips, with Malaysian Banking down 10 cents to M\$20.40. AMMB Holdings fell M\$1.50 to M\$32.00 and DGB Holdings by 30 cents to M\$7.50.

Associated Kaolin Industries surged M\$2.30 to M\$10.40, leading a charge in speculative buying. Repco jumped M\$1.50 to M\$18.00.

SINGAPORE encountered profit-taking during a hesitant day's trade that left the Straits Times Industrial index 27.05 or 1.2 per cent lower at 2,190.98.

Van der Horst rose 35 cents to \$85.80 but brokers said there was no fresh news to explain the advance.

STIC, which announced a \$500m deal to build an airport in Burma, hardened 3 cents to \$82.08 as analysts noted that the project would only lift the group's earnings in the longer term.

HONG KONG turned back after a shortlived morning surge as foreign profit-takers gained the upper hand, and the Hang Seng index, 87 points ahead early in the day, finished 72.54 down at 9,497.83.

Turnover amounted to HK\$4.2bn, compared with Monday's HK\$5.7bn.

Blue chips were out of favour as investors switched their attention to recent laggards such as Wharf Holdings, 10 cents ahead at HK\$26.35, and Citic Pacific, 30 cents higher at HK\$21.

TAIPEI was mixed after the announcement of lower than expected inflation figures prompted some late buying.

The weighted index reversed an early fall to finish 7.13 up at 5,678.31. Turnover was light at T\$25.5bn.

The country's consumer price inflation was 3.31 per cent in the year to May, while wholesale price inflation was 7.43 per cent. Brokers said the data was lower than expectations and had lifted sentiment.

The electronics sector gained ground, with Megamedia up T\$1.70 or 4.5 per cent at T\$39.40 and United Micro Electronics climbing T\$2.50 to T\$31.

Food and financials were weak: the three commercial banks, Chang Hwa, First Commercial and Hwa Nan, declined T\$1, T\$1 and T\$2 at T\$104, T\$104 and T\$110 respectively.

SYDNEY finished higher although below the session's best. The All Ordinaries index put on 8.4 to 2,020.1, while the All Industrials advanced 22.4 to 3,057.4.

Among the actives, News Corporation closed 25 cents ahead at A\$7.83 after touching an intraday high of A\$7.85 on reports that its US unit Fox Broadcasting had increased its prime time advertising rates by 25 per cent. More than 6.3m News Corp shares worth A\$66m changed hands.

The gold shares index retreated 8.9 to 1,772.2, and among sector stocks Placer Pacific finished 9 cents down at A\$2.81 while Poseidon Gold dipped 3 cents to A\$3.49.

BANGKOK saw profits taken as blue chip issues were sold following the market's recent strong gains.

The SET index fell below the 1,400 support level to close 11.04 down at 1,397.22 in moderate volume of 144.2m shares worth B\$9.7m.

Investors sold stocks in the finance, banking and telecommunications sectors after their respective indices failed to break through resistance levels several times in recent days.

The printing sector was the most active, rising 5 per cent on speculation that profits will be boosted by spending on publicity by political parties for the July 2 general election.

BOMBAY turned higher towards the close as attention focused on market leaders and newly listed finance sector shares. The BSE-30 index ended 31.81 higher at 3,399.36.

S Africa awaits forex data

Equities in Johannesburg remained trapped by lack of investor interest and domestic economic worries. Some brokers commented that market participants seemed reluctant to take positions amid continued economic concerns and political uncertainty.

The overall index put on 16 at 5,433.9 and industrials edged up 9.5 to 6,969.3 but golds eased 5.6 to 1,381.3.

Tomorrow's May gold and foreign exchange reserve data could buoy sentiment, they added, and deflected concern about a rise in interest rates in the short term. A row the ANC and Inkatha had also depressed sentiment and capped interest, especially from foreign investors, a dealer said.

A firmer rand had under-

mined price gains, especially in golds, which had found little support from a mostly static dollar price for bullion.

Among the actives, De Beers gained R1.25 at R96.75, Anglos was 50 cents better at R204 and Gencor collected 15 cents at R12.15.

Sasol firmed 50 cents to R36.25 in turnover of R22m. A report from the Liquid Fuels Task Force on the company's tariff protection is expected to be released shortly.

Samancor rose R1 to R54 after saying it had signed a joint venture agreement with Japanese companies Showa Denko and Marubeni which involved the formation of a new supplier, Middelburg Technochrome.

Vaal Reefs fell R2 to R227 and Kloof 50 cents to R39.75.

FT/S&P ACTUARIES WORLD INDICES

The FT/S&P Actuaries World Indices are owned by The Financial Times Ltd., Goldman, Sachs & Co. and Standard & Poor's. The indices are compiled by The Financial Times and Goldman Sachs in conjunction with the Institute of Actuaries and the Faculty of Actuaries. NatWest Securities Ltd. was a co-founder of the indices.																	
NATIONAL AND REGIONAL MARKETS																	
Figure in parentheses shows number of lines of stock	US Dollar Index	Day's % change	Monday June 5 1995	Yen Index	DM Index	Local Currency Index	% chg	Gross Div Yield	Friday June 2 1995	Yen Index	DM Index	Local Currency Index	% chg	Gross Div Yield	Dollar Index	Year ago % (approx)	
Australia (ASX)	165.56	-0.2	153.85	88.90	121.16	153.90	0.2	4.08	165.26	154.01	87.89	120.81	153.91	180.82	168.22	157.95	175.05
Austria (VSE)	197.70	-0.1	193.91	105.78	144.78	194.47	0.0	1.23	197.01	184.41	106.24	144.88	194.47	198.89	167.46	165.09	160.49
Belgium (Euronext)	196.40	-0.1	182.60	105.09	143.71	196.74	0.0	1.34	196.57	183.16	104.83	143.68	196.74	201.12	161.86	164.96	160.95
Brazil (B3)	146.26	2.1	146.26	78.25	107.01	146.26	2.1	2.52	146.08	137.04	76.17	104.70	237.85				
Canada (TSX)	140.94	0.2	131.04	76.41	103.13	140.51	0.2	2.52	140.51	131.04	76.17	104.70	237.85				
Denmark (C20)	202.26	0.1	202.45	101.04	205.54	210.68	0.0	1.50	202.96	203.29	150.26	205.54	210.68	217.44	238.61	244.01	242.01
Finland (HEX)	214.34	0.7	199.28	114.88	156.83	193.72	0.0	1.00	212.82	198.29	113.17	156.83	193.72	204.84	236.83	247.02	247.02
France (CAC)	188.05	-0.4	188.44	106.82	137.59	188.05	-0.4	3.00	187.94	190.30	107.01	137.59	188.05	191.74	211.21	211.21	211.21
Germany (DAX)	157.58	-0.1	146.84	84.29	115.28	115.28	0.0	2.09	157.89	148.93	83.86	115.28	115.28	157.19	162.08	138.65	138.65
Hong Kong (HSI)	374.82	0.0	348.49	200.55	274.29	372.19	0.0	3.86	374.82	349.30	193.93	274.29	372.19	416.42	377.47	378.47	378.47
Ireland (ISEQ)	230.30	-0.1	230.30	123.22	168.51	198.51	0.0	3.56	230.33	214.61	122.59	168.51	198.51	230.63	180.07	180.07	180.07
Italy (ISE)	75.98	0.9	70.84	40.65	55.59	70.84	0.9	1.17	75.98	70.84	40.65	55.59	70.84	89.92	68.46	68.46	68.46
Japan (Nikkei)	163.11	-0.3	142.35	81.82	112.03	81.92	0.3	0.92	163.90	143.13	81.86	112.03	81.92	170.10	130.93	158.97	158.97
Malaysia (FTSE)	551.96	0.8	522.48	300.88	411.19	530.97	0.8	3.51	551.97	519.65	266.62	403.57	530.97	626.86	594.76	598.18	598.18
Mexico (IPC)	980.02	-1.2	980.01	513.98	702.87	980.01	-1.2	2.51	979.95	979.95	513.98	702.87	980.01	1000.00	979.95	979.95	979.95
Netherlands (AEX)	250.49	-0.2	252.89	132.42	125.29	179.80	0.0	1.51	250.50	233.68	123.48	125.29	179.80	250.50	247.14	247.14	247.14
New Zealand (NZX)	82.93	-0.1	76.82	44.21	80.46	65.69	0.0	4.58	82.94	76.82	44.21	80.46	65.69	82.94	84.31	64.00	70.67
Norway (OSL)	222.40	-0.1	206.77	119.00	162.73	188.66	0.0	2.24	222.56	207.40	118.97	162.73	188.66	222.56	237.73	237.73	237.73
Singapore (SEI)	253.54	1.0	253.54	135.54	102.54	253.54	1.0	2.10	253.55	245.67	140.16	102.54	253.54	253.54	253.54	253.54	253.54
South Africa (JSE)	346.92	-0.1	322.54	185.62	253.84	278.08	0.2	2.47	346.94	322.54	185.62	253.84	278.08	346.94	363.22	264.31	268.81
Spain (IBEX)	149.18	0.8	138.69	79.82	108.16	137.08	0.2	4.12	148.90	138.19	78.87	108.16	137.08	149.18	153.73	151.79	124.13
Sweden (OMX)	258.84	-0.1	267.16	142.24	194.82	289.39	0.0	2.10	258.85	245.67	140.16	194.82	289.39	258.84	265.94	196.05	217.07
Switzerland (SMI)	185.46	-0.1	184.51	105.19	145.21	142.42	0.3	2.80	184.50	185.09	105.63	145.21	142.42	185.46	185.46	165.05	165.05
Thailand (SET)	175.26	0.2	162.85	93.77	128.24	167.74	0.3	2.60	174.91	162.96	93.63	128.24	167.74	175.26	175.26	175.26	175.26
United Kingdom (FTSE)	238.74	0.1	202.65	116.79	158.71	202.65	0.1	4.12	238.74	202.65	116.79	158.71	202.65	238.74	238.74	238.74	238.74
USA (DOW)	215.15	0.8	203.75	117.25	160.35	215.15	0.8	2.51	215.15	202.65	116.79	158.71	202.65	215.15	215.15	215.15	215.15
Americas (BSE)	200.86	0.6	196.75	107.47	146.57	196.75	0.6	2.81	199.74	196.11	106.22	146.57	196.75	200.86	200.86	200.86	200.86
Europe (FTSE)	190.51	0.5	177.12	101.53	139.40	196.89	0.3	3.11	188.52	176.00	100.78	138.83	190.51	190.51	185.93	165.93	165.93
Northern (FTSE)	254.77	0.5	236.87	136.32	164.42	236.87	0.5	1.93	253.25	236.87	136.32	164.42	236.87	253.25	253.25	253.25	253.25
Pacific Basin (FTSE)	153.26	-0.2	151.79	87.35	115.48	151.79	-0.2	1.28	153.00	151.79	87.35	115.48	151.79	153.26	153.26	153.26	153.26
Europe-Pacific (FTSE)	174.51	0.1	162.25	93.37	127.89	118.39	0.3	2.28	173.90	162.25	93.37	127.89	118.39	174.51	174.51	174.51	174.51
Asia-Pacific (FTSE)	214.30	0.6	199.24	114.88	156.83	213.83	0.6	2.62	213.10	199.24	114.88	156.83	213.83	214.30	214.30	214.30	214.30
Europe Ex. UK (FTSE)	171.29	0.2	158.25	93.35	125.29	136.72	0.0	2.05	170.97	159.31	93.02	124.97	135.68	171.29	171.29	148.52	148.52
Pacific Ex. Japan (FTSE)	230.78	0.3	222.46	135.54	102.54	222.46	0.3	2.58	229.91	222.46	135.54	102.54	222.46	230.78	230.78	230.78	230.78
World Ex. Japan (FTSE)	176.10	0.1	162.79	93.35	125.29	121.81	0.3	2.05	175.92	162.79	93.35	125.29	121.81	176.10	176.10	176.10	176.10
World Ex. UK (FTSE)	185.46	0.2	172.43	99.23	138.70	145.10	0.4	2.12	185.06	172.46	99.23	138.70	145.10	185.46	185.46	185.46	185.46
World Ex. Japan (FTSE)	238.74	0.5	202.65	116.79	158.71	202.65	0.5	2.83	202.65	193.49	110.43	158.71	202.65	238.74	238.74	238.74	238.74
The World Index (FTSE)	188.33	0.3	175.10	100.77	137.80	150.07	0.4	2.31	187.76	174.97	99.96	137.80	150.07	188.33	188.33	188.33	188.33

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FINANCIAL TIMES
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View from the top:
Bob Frankenberg
of Novell

Focus

Networking:
Important implications
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Software at work

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Directions

Multimedia:
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Information Technology

Wednesday June 7 1995

The real costs of buying and operating computer hardware for the office are rather like an iceberg – most of them are hidden, writes Paul Taylor

New moves to reduce the cost of ownership

The real cost of information technology has become an important issue for companies worldwide – not just the initial expenditure on the purchase of equipment but the management of on-going system costs as well.

The drive to reduce costs has been initiated by purchasers concerned at discovering the extent of lifetime expenditure on systems but has been taken up, too, by manufacturers, suppliers and specialist vendors keen to distance themselves from a possible user backlash.

For this reason, equipment vendors such as Compaq Computer, IBM and others have built features into their systems designed to improve manageability and to cut maintenance costs. The industry's desktop management task force whose membership includes Microsoft, Intel, IBM and Novell, is working towards establishing the Desktop Management Interface (DMI). This is a technical specification for managing networked PCs, printers, and other devices.

Specialist international network management software vendors such as Cheyenne Software Express Systems, McAfee Associates and Sabre Software have also found a lucrative niche market for products which improve network performance, anticipate problems and simplify management.

Novell, the market leader, and other network operating systems vendors, are also incorporating simplified installation and administration features into their software. Novell claims that the common, distributed directory, integrated services, and powerful new administrative tools in its recently launched NetWare 4.1 deliver cost benefits averaging 30 per cent.

In related moves targeting the same overall problem, many companies have contracted-out the management of particular applications, the help-desk function, or the whole network in an effort to control costs and focus more attention on their core competencies.

This growing interest in ownership costs is reflected in a number of recent studies demonstrating that the hardware itself is the least important factor in overall costs.

Over the typical five-year life cycle of a desktop system, hardware accounts for perhaps 10 or 12 per cent of the total cost of ownership. The vast bulk is the labour cost involved in support, administration and, most importantly, end-user operations.

The Gartner Group calculated in 1987 that the five-year cost of ownership for a typical company of a Dos-based system was \$19,296. By last year, that cost had more than doubled to \$41,536, even though capital costs had fallen from \$5,403 to \$4,004, reflecting sharp declines in the price of hardware and software.

The labour-to-capital ratio which was 70:30 in 1987 had risen to 90:10 by 1994. This compares with ratios of around 60:40 for minicomputers and as low as 20:80 for mainframes.

Commenting on the figures, Gartner analysts noted: "The strategic value of PC technology is increasing rapidly, but the cost of this technology may be prohibitive if aggressive action is not taken to reduce the (labour) overhead." Gartner suggested that total costs could be reduced by half over time but concluded: "Clearly Dos continues to be a labour-intensive and costly desktop environment... we recommend that users run, not walk, away from Dos-based technology."

Windows 3.x makes Dos easier to use and therefore leads to reduced end-user operations costs – 57 per cent of total five-year costs compared with 61 per cent for non-Windows systems – but Windows still suffers because of its Dos underpinnings which lead to higher technical support costs.

Over a five-year period, a Windows 3.1 system with eight applications costs virtually the same as a Dos system with four applications, but the make-up of these costs has changed dramatically and the Windows system offers much more functionality and usability than Dos.

Microsoft claims Windows 95, due for release later this summer, has been specifically designed to reduce total cost of ownership through increased ease of use, functionality and support, in addition to reduced administrative costs.

Windows 95 reduces these costs by using 'plug-and-play' technology and a software tool called the registry, a single point of reference for hardware, software and user profiles as well as for system policies. This enables PC and network managers to manage Windows 95-based PCs remotely by enabling or disabling centrally more than 50 different user privileges and features.

Gartner estimates that Windows 95 end-users' costs will be 18 per cent lower and technical support costs will be 12 per cent

less than Windows 3.x because of the improved stability of a network-aware system coupled with advanced diagnostic and trouble-shooting tools.

One of the key strengths of the new generation of operating systems such as Windows NT, Windows 95 and IBM's OS/2 Warp is their support for computer networking. There is a continued strong trend among companies on both sides of the Atlantic towards client/server computing – distributed systems in which an application is split into parts that are executed in different places.

However, studies suggest that few of those involved in this movement away from traditional mainframe-based systems fully calculate the costs involved. One obstacle to establishing the true costs of client/server computing is the complexity of systems and the wide range of equipment involved. Once again, however, client/server systems turn out to be very labour intensive.

In the case of a large organisation with 5,000 client workstations in 250 remote sites, each with a local PC-based server connected to a battery of enterprise servers, Gartner estimates that labour costs account for 71 per cent of the total cost of ownership of \$48,400 per user over five years.

Technology costs, including all client and server hardware, software, upgrade, maintenance and communications elements represent only 21 per cent of the total, and most of that is spent on the desktop rather than the server, according to a Gartner report published earlier this year.

"Too often, traditional client/server cost evaluations focus on the enterprise server costs," says the report. "In our analysis, the hardware and software costs for three enterprise servers cost less than three per cent of the total."

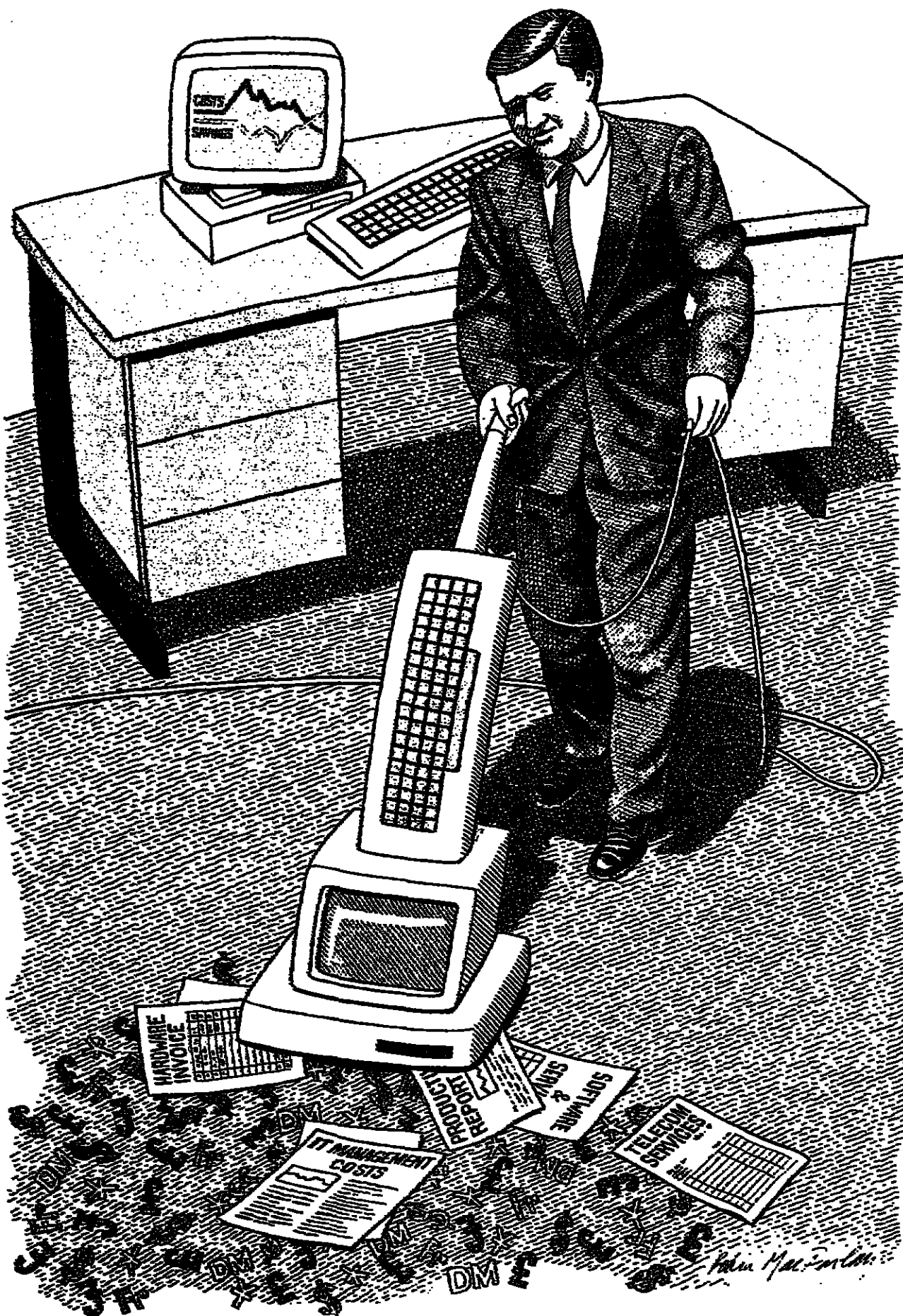
Unfortunately, corporate resources and investments have often been focused on seeking improvement by addressing the wrong cost elements – technology rather than labour. Gartner suggests that reducing complexity, investing in training and in systems management and end-user support tools – including using technology to automate labour-intensive tasks such as electronic software distribution and server file backup – can all help reduce costs.

Nevertheless, client/server computing needs to be approached as a long-term investment, not a short-term fix to reduce high mainframe costs or a blind move to a new technology.

"Cost should not be the main issue," in deciding whether to move from mainframe-based to client/server computing says Mr Andrew Dailey, an analyst with Gartner in Europe. "The real debate is what should the IT infrastructure look like and what is the best way to address different needs."

Indeed, the real benefits of client/server computing lie not in cost-saving, but in the opportunity it provides for rapid application development, improved flexibility and perhaps most crucially, faster time to market.

In any event not all independent consul-



tants and market research firms agree with the assessment that client/server computing is an expensive option.

There are also some studies which suggest that the costs of client/server computing may have been exaggerated. A recent report published by the UK-based OTR research group, on the evidence of a survey of over 2,000 European companies, reached a number of surprising conclusions: the OTR study suggests that it is a

myth that users waste significant amounts of time and require higher support costs. On average, the total amount of time needed to support networked PCs in a client/server environment is less than 15 minutes a day.

However, OTR concedes that some installations are inefficiently operated and suggested three steps to reduce wasted time – removing disks from desktop PCs, restricting end-user functions and applica-

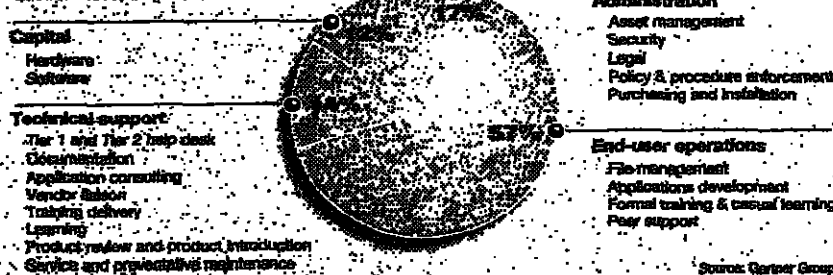
tions package training.

The report also says that maintenance costs, including hardware maintenance, software support maintenance and network maintenance, are not higher. Companies that had moved from mainframes entirely had reduced maintenance budgets considerably because there was no further need for large maintenance contracts.

Continued on page two

The cost of ownership

Personal computing: five-year costs of a PC, missing Windows 3.1 is \$41,000 or \$8,200 a year. Labour 88%, Capital 12%



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2 IT view from the top / focus on computer networking

■ Interview - Bob Frankenberg of Novell talks to Louise Kehoe

A pot-shot at the 'Microsofties'

Like many others in the software industry, Novell, the leading supplier of local area network software, is eager to participate in the emerging market for on-line electronic commerce

From Bob Frankenberg's perspective, computers are merely nodes on an information network. As chairman and chief executive of Novell, the leading supplier of local area network (Lan) software, he views the challenges of the information technology industry in terms of giving users access to information "anywhere, anytime".

A 25-year veteran of Hewlett-Packard, Frankenberg joined Novell last year and immediately found himself in the hot seat. The company was embroiled in a war of words with Microsoft over anti-trust issues and was in danger of losing its focus on networking with the acquisition of WordPerfect. A struggling PC applications developer.

Frankenberg moved quickly to calm - but not extinguish - the battles with Microsoft, re-organise Novell, and redefine the company's mission as the provider of software to enable "pervasive computing" or the ability to deliver information to computer users wherever and whenever they might need it.

One of the most important trends in the IT industry, says Frankenberg, is the merger of local and wide area networking - "I find this very exciting. Very soon, from a user's perspective and from a system manager's perspective, the wide area network and the local area network will become one and the same thing."

"The user will be able to connect to any computer or network anywhere in the world at speeds and with the features that are today associated only with local area networks," he predicts.

"The Internet provides only part of the solution, says Frankenberg - 'the Internet is wonderful... but there are some things the Internet does not do well. The lack of security is one issue, guaranteed performance is another.'"

The growth of the Internet, with some 30m or more people now linked to the global "network of networks", has exacerbated these shortcomings, says Frankenberg. For example, while the Internet provides very low cost, global electronic mail service, data traffic congestion can sometimes cause delays and users cannot be sure how long it will take for a message to arrive at its destination. The Internet also lacks directory services - "surfing the World Wide Web is like entering a library with the lights turned out. It is very difficult to find what you are looking for," he observes. Unless you know somebody's electronic mail address, it is almost impossible to send them a message.

Security has become a more critical issue as businesses have taken to using the Internet. Security measures such as firewalls and authentication are making the Internet "more secure, but not secured," says Frankenberg. "I think that in electronic commerce, certainly where large sums of money are involved or where there is the risk of replication of account numbers that could be abused, businesses are going to demand a secured system."

Ever the salesman, Frankenberg points out that the latest version of Novell's NetWare network operating system provides directory services that can be used not only to find people or documents on a network, but also to forbid access to unauthorised users.

Novell, in partnership with AT&T, the US telecommunications company, is offering a solution to the Internet's shortcomings by providing secure encrypted links between remote local area networks. The AT&T NetWare Connect Service will be expanded, Frankenberg says, through agreements with regional telephone

companies in the US and PTIs in other countries so that "I can call you and your Lan becomes connected to mine. We still have full security and it runs at Lan speeds."

Novell is not trying to compete with the Internet, he insists: "We think of this as very complementary. It isn't a choice between our connect services and the Internet - you get both."

Like many others in the software industry, Novell is eager to participate in the emerging market for on-line electronic commerce. As part of Microsoft's recently cancelled plan to acquire Intuit, publisher of the popular Quicken personal finance program, Novell was to have acquired Microsoft's cast-off product called Money.

However, Frankenberg made no secret of the fact that he regarded Money as a second-best product and would prefer to continue a prior licensing agreement with Intuit for Quicken. Microsoft's decision to call off its merger with Intuit will make this possible.

But the personal finance program is only one of the elements required to succeed in electronic commerce, he says - "the other thing that is needed is secure transactions over the network. We have the capability to deliver that and Microsoft doesn't," he claims.

What is more, the further Microsoft is perceived as a threat by banks, financial institutions and publishers, the better it is for Novell, he claims. "We are working with lots of partners who are afraid of what Microsoft might do next. They are delighted to work with us because we want to see them be successful at what they do."

Frankenberg's predecessor at Novell, Ray Noorda, was an outspoken critic of Microsoft's business practices and the company actively co-operated with US government anti-trust investigators as well as filing



an anti-trust complaint against Microsoft in Europe.

Frankenberg takes a different approach. He has defused some of the heated rhetoric and even reached an agreement with Microsoft to collaborate in offering support services to customers that use both Microsoft and Novell products.

Nonetheless, he does not miss an opportunity to take a pot shot at the "Microsofties". Windows 95, the long anticipated new version of Microsoft Windows, he says, "has some very nice features. It is nice to see the world's most popular desktop operating system catching up..."

"I think it is going to take a little more time than Microsoft hopes for there to be a large scale movement (to the new operating system)," he suggests, "especially in parts of the world where a 486 PC with eight megabytes of memory is

a pretty expensive beast."

Although Novell is working hard to bring out a new version of its PerfectOffice applications suite for Windows 95, the company will continue to develop 16-bit applications for parts of the world and companies that are going to take more time to make the switch.

Neither is Frankenberg daunted by the so-called "client/server backlash" as computer users tally the high costs of managing computer networks.

"It is harder to manage client-server networks than central host computer systems. We should not kid ourselves," he says. About 70 per cent of the cost of a local area network is in system management and maintenance, according to Novell's calculations. "That creates a tremendous opportunity to reduce costs... and new opportunities for Novell," he insists.

■ Looking ahead - Paul Taylor highlights advances in internetworking

Revolution in computer networking

By the end of the decade, more than a billion people will be able to connect to computer networks

Computer networking is ushering in changes as profound as those which swept through business organisations with the arrival of the desktop personal computer at the start of the 1980s.

Over the past decade the computer industry has been transformed as stand-alone personal computers have been hooked together to form Local Area Networks (Lans) and then Wide Area Networks (Wans) to share applications, data and peripherals.

According to Dataquest, the market research firm, 70 per cent of business PCs in the US and almost 60 per cent in Europe are already connected to Lans - "networks provide the infrastructure for powerful information systems," says Novell, the network operating system market leader. "They make people more effective in how they use information whether in their homes, at work or wherever they might be."

Today, distributed computer systems and client-server networks are rapidly replacing mainframe systems for many applications, including those "mission critical" processes on which organisations depend.

Highlighting this trend, 84 per cent of a 'Fortune 1000' sample study, undertaken recently by Forrester Research of the US, said they planned to implement one or more client/server core applications over the next three years.

According to Price Waterhouse, clients list four basic reasons for implementing client-server technology, even though the firm's latest Technology Forecast says that "like any new set of technologies, client/server is risky."

The reasons for implementing the technology are the widespread use of simple to use graphical user interfaces such as Microsoft Windows on client/server networks, the expectation of lower IT costs over the longer term, perceived gains in terms of flexibility and speed of development, and the opportunity to move to powerful new packaged applications.

Since the late 1980s Lans themselves have been interconnected using devices such as routers, hubs and bridges to form enterprise-wide computing systems changing the way organisations do business and further blurring the distinctions between data processing and telecommunications.

New challenges for IT departments

"There are a number of forces driving the internetwork evolution: business demands, new bandwidth-intensive applications and technology advances," says Paul Severino, chairman of Bay Networks.

Companies and individuals such as 'teleworkers' are using a variety of methods to connect together remote sites. These range from dial-up modems and ordinary analogue telephone lines to integrated services digital network (ISDN) lines and dedicated high speed digital links.

"The Lan internetworking market has evolved dramatically in the last five years and has now become the centre of attraction of the entire networking industry," Olivier Choron of Dataquest says in a report on internetworking.

The explosive growth of Lans, client/server systems and internetworking has presented new challenges for IT departments used to dealing with centralised mainframe-based systems and applications.

On the one hand, IT managers are faced with the unrelenting proliferation of desktop systems, increasing demands by end-users to network these systems and the growing complexity of networks and network applications. On the other hand they are charged with maintaining or cutting corporate computer costs

while ensuring that their systems contribute to the organisation's overall competitive position.

"The management of networks is the major issue affecting networks," says Gerhard Sundt, an analyst with Gartner Group in Europe. Network managers are turning to specialist software packages increasingly to help them monitor the network, improve its performance and predict problems.

Aside from managing the network itself and the applications which run on it, Mr Sundt also identifies security as a key issue, particularly with the growth of connections to the Internet - the global system of computer networks.

"Distributed security is an oxymoron," he says, adding that about 80 per cent of network security violations are connected with the Internet.

The drive towards internetworking has also focused attention on the integration of existing networks and systems, and on the market for internetworking devices. In Europe alone, an estimated \$4bn will be spent on internetworking products this year from companies such as Cisco, the worldwide internetworking product market leader, 3Com, and Bay Networks - formed in October when SynOptics and Wellfleet Communications merged.

At the PC Lan level, Compaq Computer, IBM, Digital and other hardware vendors have developed high-powered machines for the \$100-a-year PC-based server market. Meanwhile, Novell's NetWare has become the undisputed market leader in networking software with around 72 per cent of the global network operating system market according to IDC.

However, Novell faces competition from rivals including Microsoft which with its Windows NT server, IBM Lan Server and Banyan Vines each of which have around seven per cent of the market.

Electronic commerce is reshaping business

Until recently, computer networking was generally viewed as a narrowly focused, technical subject for computer specialists. Now, however, it has become synonymous with a raft of profound changes which are expected to reshape business in the late 1990s.

Among the expected changes are the growth of electronic commerce such as electronic data exchange, and multimedia services such as interactive television and home shopping, multimedia kiosks and cable-based video-on-demand. In other areas, such as desktop video-conferencing, computer networks could also begin to have a profound effect on communications and the need for travel.

"These changes imply more flexible and higher capacity networks than those available at present. The chief technical change is expected to be the emergence of an enterprise-wide, high speed network capable of carrying all an organisation's electronic traffic."

Faster PCs and network servers and larger files already mean that many networks are crowded and outgrowing the standard four, 10 or 16 megabits per second transmission speed of standard Ethernet and Token Ring Lans. A recent Dataquest survey revealed that almost a quarter of companies thought the speed of their current Lan was inadequate.

With many Lan-based applications already pushing the limits, there is increasing interest in high-speed networking technologies capable of delivering up to 100Mbps such as Fast Ethernet and Asynchronous Transfer Mode (ATM) which will be capable of supporting data, voice, graphics and video.

Some indication of the scale of the networking revolution underway is given by the prediction from Novell that by the end of the decade more than a billion people will be able to connect to computer networks as they expand to include telephones, televisions and a growing range of 'intelligent' devices.

ON OTHER PAGES OF THIS IT SURVEY

■ COMPUTER NETWORKING

See pages 2-9: for more details of topics included in the networking section, see panel, right, with report on the revolution in computer networking.

Free entrance to 'Networks 95' - special offer for readers of this FT Review: see details on page 7.

■ OUTSOURCING

IT services: users take a tactical view, page 10.

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■ SOFTWARE AT WORK

Computer aided design and project management: how users save time and money, page 11-13.

■ MULTIMEDIA DEVELOPMENTS

The home consumer market is leading the way: new applications, pages 15-17.

■ IT UPDATE

IT industry news and market trends: business opportunities on the Internet, pages 14, 17 and 18.

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For details of the next issue of the Review in July, see page 18. Editorial background information for consideration should be sent in writing one month before publication, to:

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Key pointers in reducing the cost of ownership

Continued from page one:

Similarly, training costs are not higher because most training is one-off: standard 'look and feel' interfaces, such as Windows, have eliminated many problems; and trained PC users are productively using more applications than in the past.

Neither, claims OTR, are network costs a significantly increased item. Although poor client/server design can lead to unnecessarily high traffic and costs, OTR argues that these can be avoided and that expensive downtime can be minimised by using the sophisticated network management software which is now available.

The key message for those businesses considering investing in new IT systems is that it is not enough to look at the initial capital costs - the full costs of the system over its

expected lifetime, particularly labour costs, need to be examined. Similarly, while no two sets of circumstances will produce identical answers, estimating real costs should have an important bearing on choice of operating systems. However, the decision to move from mainframe based systems to client/server systems should be motivated by competitive factors other than cost.

Meanwhile, IT departments, faced with the growing complexity of networks and ever more-demanding end-users, should be encouraged to investigate the new software tools which can help minimise running costs.

□ 'A Guide to Estimating Client/Server Costs': Gartner Group, tel +44 (203) 961 0086.
□ 'Does Client/Server Computing mean Higher Costs?': OTR, tel +44 0171 402 5374.

Networking topics on the following pages include:

The Internet and internetworking hardware	Pages 2-3
Advances in high speed networks: fibre optics; ATM technology	Pages 4 and 5
Local and wide area networks; virtual private networks	Page 6
Mobile communications; electronic data interchange	Page 7
Systems integration, network management, case studies	Pages 8, 9 and 10
Security: data protection on networks	Page 9

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■ Network hardware - Report by Louise Kehoe in California

The 'server' market is highly segmented

Most computer makers claim a significant role in the sector

The computer industry is notorious for its technical jargon, but when it comes to describing the current generation of computers that are linked to networks, the industry's vocabulary falls short.

In the industry vernacular, there are simply two types of computers for networks: "clients" and "servers". The clients are single-user machines, typically desktop computers. Servers, however, can be anything from a PC to a mainframe - just so long as they provide services on a network.

The ambiguity of the terminology allows almost every computer manufacturer to claim a significant role in the server market. In reality, however, the market is highly segmented.

The fastest-growing segment of the market is Internet servers: computers which provide

access to the Internet for local area networks as well as to create corporate World Wide Web sites.

Sun Microsystems is the leader in this field with an estimated 56 per cent of all servers on the Internet, according to a 1994 survey conducted by the Internet Society.

The latest versions of Sun's Netra Internet servers, introduced in May, come pre-configured with WWW server software, connectivity for PC networks, security enhancements and system administration software tools.

"The Netra Internet server" appeals to a broad customer base because it is the only Web server that doesn't require Unix expertise to install and manage," says Carl Stolle, Sun's director of server product marketing.

Netra prices range from \$8,000 for a workgroup server to \$16,000 for a departmental server.

Silicon Graphics is another leading provider of dedicated WWW servers. Its Webforce line of servers can handle

thousands of WWW transactions per minute, the company claims, and come pre-loaded with Netscape's WWW server software.

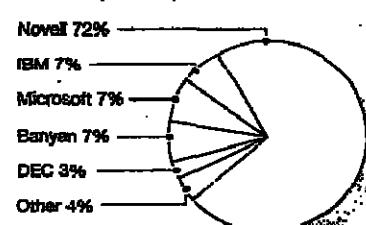
Hewlett-Packard has one of the widest ranges of server products, ranging from personal computer-based workgroup servers to "mainframe alternative" servers that can be used to support the operation of a company-wide network.

Another large category of servers is the local area network (LAN) application PC server. In this segment of the market, which is growing at about 45 per cent a year, Compaq Computer has the leading market share with its ProLiant line of servers. The latest ProLiant model, introduced in May, is built on up to four Intel Pentium microprocessors and up to one gigabyte of memory and delivered with a selection of software pre-installed, according to customers' choices.

Aimed at workgroup or departmental local area net-

Server network operating systems

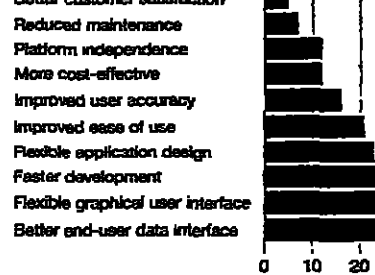
Node shipments, June 1994



Novell is the leader in network operating systems. Its Netware product accounts for more than 65% of all operating system shipments and is run on more than 2m servers, supporting over 40m users worldwide.

What are the benefits of moving to client/server core applications?

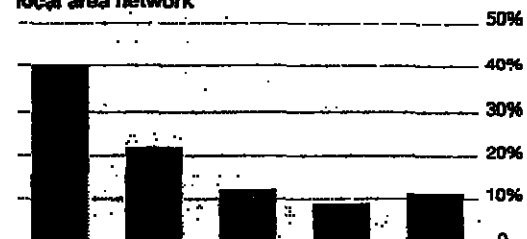
% of 43 Fortune 1,000 companies planning client/server core applications?



Source: Forrester Research Inc.

The drive towards networked office environments

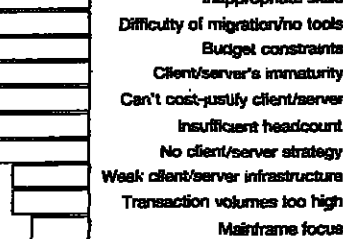
Percentage of personal computers connected to a local area network



Source: IDC, Spillix Court, Taylor Nelson

What hinders your move to client/server core applications?

% of 51 Fortune 1,000 companies



works, this top-of-the-range PC server provides the performance of a mid-range minicomputer at about half of the price, Compaq claims.

At the other end of the

server scale are mainframe computers, which are being "born again" in the role of enterprise servers, according to IBM. Mainframe computers are becoming more "open" with

software that adheres to industry standards, and will support standard communications protocols to bring them into the client-server arena, company executives say.

■ Interconnection hardware - a look at the latest options - report by Joia Shillingford

Higher speed networks without huge expense

Companies want faster networks and better access to even the smallest branches. But can this be achieved without big financial outlay?

There are many ways of speeding up a network. But in the short term, "Switched Ethernet" provides a pragmatic alternative to a number of other technologies. It is more flexible than routers (used to link two local area networks (LANs), or to split a LAN into two or more segments and ease congestion); and it is

more widely available than ATM (Asynchronous Transfer Mode).

"People are buying Switched Ethernet because it addresses capacity problems in large Ethernet networks without them having to tear everything out," says Mr Stephen Campbell, sales and marketing manager of the Glasgow-based Lan Support Company.

Many plan to implement ATM - billed as the high-speed networking technology of the future. But they are waiting for prices to fall and standards to be finalised, according to Michael Long, a senior manager at the computer services company, Hoskyns.

In the meantime, Ethernet remains the most popular net-

working standard. A traditional Ethernet network is one big loop, so traffic destined for one terminal, gets broadcast to all PCs at a background level. This is rather wasteful in terms of network resources. It means that all PCs share a bandwidth of 10 megabits a second (Mbit/s) or less.

By contrast, in a Switched Ethernet network, a device called a switch sits at the centre of a number of lines - typically 12 or 15. Groups of PCs are connected to the end of these lines and data only travels down the sender's and recipient's lines - it does not get broadcast to everyone. Fewer PCs share each 10 megabit line, which means faster throughput and less congestion.

In addition, Switched Ethernet speeds up the busiest part of the network, such as the link with the network server (a powerful computer which stores files). The line between the switch and the server (or servers) can operate at 20 Mbit/s.

Moreover, Switched Ethernet supports two-way data flow so that a host system can send and receive at the same time, whereas standard Ethernet only supports traffic moving in one direction at once.

Such advantages helped to persuade Edinburgh-based investment management specialists Ivory & Sime to opt for Switched Ethernet. It made a direct comparison between investing in Switched Ethernet

or using a router to turn one large Ethernet network into two linked segments. In the end, it decided against routers because in very large networks they do not offer the same ease of expansion.

Ivory & Sime uses Switched Ethernet in-house but routers to link LANs at its London, Hong Kong and US offices to its Edinburgh head office. The Lan Support Company (which helped build the solution for Ivory & Sime) expects this kind of model to become common, with routers relegated to the purpose for which they were designed: wide area communications.

□ Linking branch offices: Olivier Choron of Dataquest

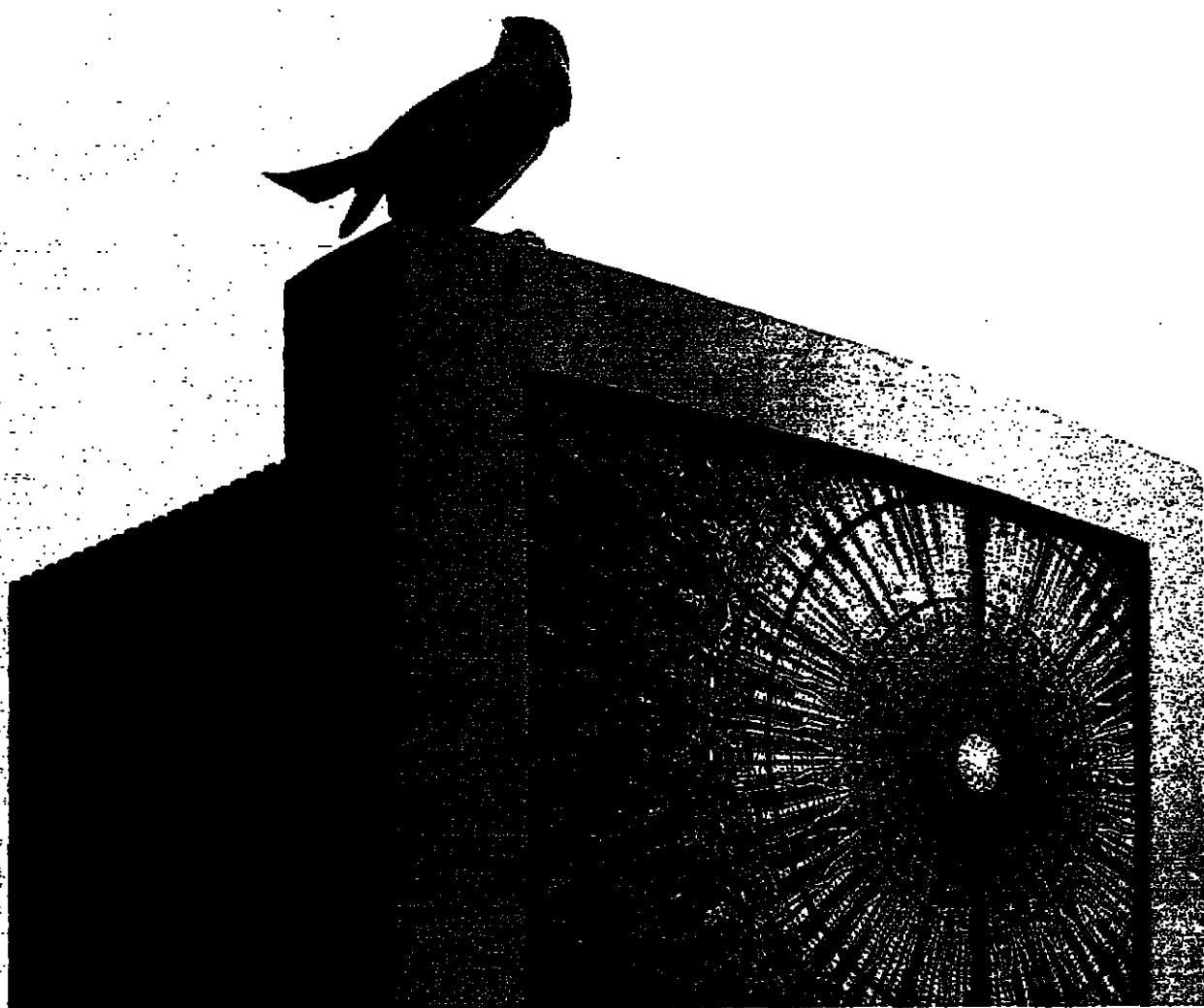
says that most of the growth in the router market is coming from the low-end. He predicts that the European market for all routers will grow from 138,593 units shipped in 1994 to 231,245 in 1995, with low-end routers accounting for 179,710 of the units shipped in 1995.

"Many companies have already linked up their main networks," says Mr Choron, "but the wider availability of ISDN (integrated services digital network) is making it feasible to link small branch offices, too."

This can be done economically by using ISDN routers at each site to be connected. Data can then be sent or received over the public ISDN network

Continued on next page

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4 IT focus: networking

■ High speed networks - US research project will link five supercomputer centres, reports Geoffrey Wheelwright

Preparing for the information highway

Speed is everything for the planners of tomorrow's high volume data networks

In order to deliver the grand vision of the information highway that so many industry leaders in the computer and telecommunications have promised, data communications networks are going to need to be fast - and offer huge volumes of capacity. US telecommunications giant MCI Communications took a step toward making that vision a reality in April when it unveiled a joint plan with the American National Science Foundation to introduce a new high-speed network known as the very high speed Backbone Network Service (vBNS) - which will link five US supercomputer centres.

The National Science Foundation, established in 1950, is an independent agency of the federal government to promote and advance scientific progress through grants to educational and research institutions for research and education in the

sciences, mathematics and engineering. MCI says the jointly-developed vBNS will be the first nationwide high-speed network to "use advanced information age technologies that enable massive amounts of voice, data and video to be combined and transmitted at speeds nearly four times faster than currently possible".

According to Bert C. Roberts, Jr., chairman and CEO of MCI (turnover last year: \$13.3bn), the high speed network will offer a chance to test the potential of fast networks - "using the very latest technology, vBNS will serve as the R&D lab for the 21st century," he says.

This network will open a whole new world of support for high speed applications and set the stage for the exploration of business applications... the technology will play a major role in establishing the next generation of networks and be a benchmark for how the Internet will work in the future."

The vBNS will serve as a national "exploratorium" for developing new critical network technologies and applications that will run over the National Information Infra-

structure (NII - sometimes referred to as the information superhighway), says MCI. It will provide scientists and researchers with faster communications links between supercomputing sites working to solve what US scientists call "the grand challenges."

These challenges, first articulated by the US Office of Science and Technology Policy, are supposed to be "fundamental problems in science and engineering with broad economic and scientific importance whose solutions can be advanced by applying high performance computing techniques and advanced networking resources."

The vBNS will link together the Pittsburgh and San Diego Supercomputing Centers; the Cornell Theory Center; the National Center for Supercomputer Applications in Urbana, Illinois; and the National Center for Atmospheric Research in Colorado.

The new network service will be accessible to select applications sites through four access points located in New York, San Francisco, Chicago and Washington, DC. The vBNS will operate at speeds of

155 Mbps (million bits of data per second) and is planned to operate at greater than 600 Mbps by 1998.

MCI is also pursuing better ways of providing content on the mainstream high-speed networks of the future. The company's strategy for this lies in joining forces with Rupert Murdoch's News Corporation to "create and distribute electronic information, education and entertainment services to businesses and consumers worldwide."

In a recent announcement, the two companies pledged to create "a worldwide joint venture that they will own equally, leveraging the vast broadcast, satellite, programming and publishing resources of News Corp; and the marketing prowess, customer base and intelligent networks of MCI and its global partner British Telecom."

To solidify the long-term strategic relationship, the companies announced that MCI will invest up to \$2bn for an equity stake in News Corp, which would make MCI the largest outside share owner. An initial investment of \$1bn

of preferred stock and warrants will be made at the closing of the agreement, expected in a few months.

"Until today, no one has put together the right building blocks - programming, network intelligence, distribution and merchandising - to offer new media services on a global scale," said Rupert Murdoch, News Corp chairman and chief executive officer.

MCI's network infrastructure, software development capabilities, brand names and customer relationships in the US and globally will be critical to any success the worldwide joint venture may achieve.

According to MCI, the extensive computer intelligence of the MCI network "will allow it to work with News Corp to cre-

ate, deliver and bill differentiated products combining telephony, information and entertainment services". The company says that these will be sold and serviced as attractive consumer and business packages to MCI customers.

"Together, we can produce television, movies and publications; provide broadband network and direct broadcast capabilities virtually anywhere; and leverage effective sales forces and brand names known around the world," says MCI's Bert Roberts. "Our relationship with News Corp is in perfect 'synergy' with what MCI is already doing with BT."

News Corp brings extensive TV and film, publishing and satellite broadcasting assets in America and elsewhere to the



The new high speed network aims to open the way for the exploration of international business applications

worldwide joint venture, including Fox Broadcasting Company, Twentieth Century Fox, the New York Post, TV Guide, BSKYB (European direct broadcast satellite system), Star TV (pan-Asian direct broadcast satellite), HarperCollins Publishers and more than 130 newspapers with leading market shares in the UK and Australia.

"Imagine being able to

access the innovative Internet MCI and Delphi Internet shopping and on-line information over the same service that brings you first-rate original entertainment," said Murdoch. "Imagine being able to retrieve computerized information stored in the MCI network wherever you are, whenever you want, without limitation. That's the power of this relationship."

■ New European network - multimedia project is a world 'first' - Martin Pipe reports from Berlin

High speed university links

Pioneer system connects medical researchers in Germany and Norway

Research (a section of Norway's public network operator) in Oslo.

The project's costs are likely to reach nearly £22m (\$28m) by 1996. Half of this money has been contributed by DFN, the government-funded organisation that provides communication services to the German research community.

Much of the ATM technology for the project is being supplied by Cisco Systems. ATM is the switching technology employed by broadband ISDN, hailed as the large-scale networking standard of the future.

Cisco is a leading global supplier of enterprise network equipment, with a turnover of more than £1.2bn in 1994. According to Philippe Brawerman, Cisco's European president, "people are now multimedia-capable". Complex concepts are not communicated particularly well through text-based systems, such as conventional e-mail, but the much more 'human' descriptive facilities of sound, graphics and video can be used to get the message across far more effectively, and in less time, he says.

Teleconferencing is likely to play an important part in the

commercial future, since regional offices can share ideas without the need to travel. The idea of 'telecommuting' - where employees work from home - has previously been held back due to currently restrictive methods of communication.

At a more advanced level, engineering students at different Berlin sites called up technical drawings, automatically entering the computer-aided design software. Together - and remotely - they worked on modifications to the drawings. The final demonstration linked into Cisco's WWW server in San Jose via a 1Mb/s leased line.

Although not as fast as the 155Mb/s (or 155m bits per second) lines being used to tie together the European sites, the bandwidth was nevertheless sufficient for corporate videos to be run. Try doing that with a v.34 modem - which is around 10,000 times slower.

The e-mail address of the writer, Martin Pipe, is: uhahnet@ccr.computelink.co.uk

Networking and multimedia: see pages 15 to 18

Benefits for home-based workers

Continued from previous page:

on a pay-as-you-go basis.

ISDN can also be used to connect home-based workers to the company network. Mr Choron says teleworking (using computers and phone to connect to the main office) is becoming important in areas such as the UK, Germany and the Nordic countries.

Companies wanting to provide remote access for individuals will tend to install remote LAN access servers. And they will equip remote users with ISDN cards/adapters or modems and software.

Mr Choron believes that low-end routers and bridges (similar to routers but with less intelligence) will eventually converge to become a single ISDN-based interconnection product. Traditional bridges are dying, he says, but some

companies are installing ISDN-based bridges.

ISDN-related communications devices are growing strongly, because ISDN usage costs are within the reach of small companies as well as large ones with satellite offices. Dataquest says the overall European market for ISDN products (including routers and remote bridges with integral ISDN dial-up capability) "grew above all expectations by trebling from 14,158 units in 1993 to 44,443 units in 1994".

The market for Switched Ethernet is growing even faster. North American sales grew from \$77m in 1993 to \$300m in 1994. In 1994, European sales were \$101.3m and Dataquest expects them to reach \$302.9m this year.

US company Kalpana was early into the market and

accounted for 88 per cent of North American Switched Ethernet revenues last year. Other suppliers include: Cisco Systems, Digital Equipment, 3Com, Grand Junction and Network Peripherals.

Ethernet switches are in demand because they are affordable, costing around £1,000 or less per hub. So a 15-port switch will cost £12,000 to £15,000. The beauty of the technology is that it will work with users' existing cabling and the Ethernet cards in users' PCs.

Companies adopting Switched Ethernet will also need a wiring hub or hubs costing £2,000 to £10,000, though in some cases switches are replacing hubs, as a way of dividing LANs into smaller sub-groups.

In the longer-term, many of the companies which are buy-

ing Switched Ethernet today will opt for 100 Mbit/s Ethernet or ATM in the future. For example, Ivory & Sims's Syn-Optics 3000 and 5000 hubs (used in conjunction with a Kalpana EtherSwitch) can be upgraded for ATM simply by plugging in ATM cards.

ATM has wide industry support, yet it will be several years before there is a wide choice of affordable products. This means that even users who are committed to adopting ATM are unlikely to introduce it this year. When they do, some users will make the leap from traditional Ethernet to ATM in one go. But for those who need extra capacity now, Switched Ethernet may be the answer.

The writer, Jola Shillingford, is Associate Editor of *Business Computing Brief*, the *Financial Times* newsletter

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■ **Wider benefits of networks** – the implications go far beyond the office, reports Geoffrey Wheelwright in Vancouver

Teleworkers gain more flexibility

Telecommuting, via the office network, also offers big changes in lifestyles

Of all the hype surrounding computer networks these days, none is as all-embracing as the interest in "networks of networks" – with the Internet being the crowning example. But whether these networks are created using local area networks (LANs), wide area networks (WANs), or connections to the Internet, one of the key driving forces behind them is the demand for the creation of a mobile and remote workforce that does not require large areas of office space and traditional corporate infrastructures.

Employees also want greater flexibility in working arrangements to enable them to spend more time with their families

while employers look for ways to cut costs and yet encourage higher productivity from their workforce. According to Bob Frankenberg, chief executive officer of Novell, the world's largest PC network software company, telecommuting or "teleworking" is drastically changing the way – and the hours – that people work.

"One surprise is that people tend to work longer and not just by saving what would have been commuting time," he says. "Since they can work any time and the work is there – it draws them in. We've found there's a ten to 15 per cent increase in the hours that people work... but many of our office work structures are a disincentive to work – we are supposed to work during specific hours."

He concludes that the benefit of all this is flexibility – where telecommuters can now organise their time so that they can go out with their family for a

walk in the middle of an afternoon, in the knowledge that they can also work late at home, if necessary. He predicts a post-industrial revolution change of work and lifestyle.

"We will no longer have specific numbers of hours of work and equipment to tend," concludes Frankenberg. "People were once the robots that served the equipment – and now there will be personal choice."

Chris Unsworth, international marketing director for 3Com, a \$100-plus operator in the network computing market, also has strong views on teleworking. His company has carried out intense research in this area in the US and Europe.

Among the significant projects reviewed by 3Com is the "Smart Valley" initiative in California's Silicon Valley. This is a non-profit, IT pilot programme in the Southern Bay Area – backed by a coalition of organi-

sations such as Hewlett-Packard, Tandem, 3Com, Silicon Graphics, Pacific Bell and Stanford University. According to Mr Unsworth, the idea is to facilitate the construction of a high-speed communications system and information service to benefit all sectors of the community – in education, healthcare, local government, business and at home.

Smart Valley has five main projects: the Bay Area Digital Geosource (Badger) which helps organisations comply with environmental regulations; CommerceNet, the first large-scale market trial of electronic commerce on the Internet; Smart Valley Public Access Network (SVPAN), which provides Internet access to schools, libraries, hospitals and shops and is free to users in Santa Clara; and Smart Schools Collaborative which expands network-based learning to all 328 schools in Santa Clara and the Smart Valley Telecommuting Project in

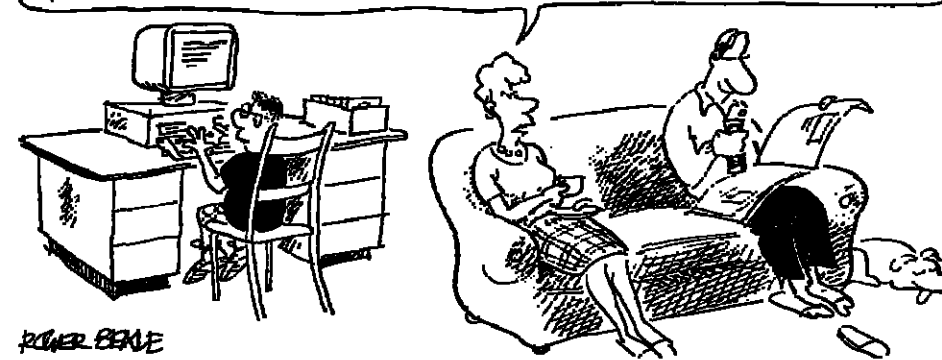
which 3Com has strongly participated; 3Com's president Eric Benhamou heads up this part of the initiative.

Teleworking in Smart Valley "moves the work to the workers," says Mr Unsworth. There are three types of teleworking: from the home (which is apparently the most popular – where the employee designates workspace at home one or more days a week), from a "satellite office" (generally a shared office located near a large cluster of employee homes) or from a neighbourhood work centre.

He adds that much of the inspiration for the teleworking project in California lies in the growing demands of environmental legislation on business practice. For example, the 1988 California Clean Air Act and the "ridership goal" of 1.4 passengers per car by 1990, provided a target which focused the attitudes of many Californian companies.

The first results of the "final pilot" unveiled after a study by

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Gemini Management Consultants, show that:

□ Teleworking must be voluntary. If companies have employees who think they would be good candidates for teleworking, they should discuss it with them.

□ Teleworker productivity gains were "remarkable." Staff estimated that their productivity increased by 25 per cent on their teleworking days, resulting in a 20 per cent increase for their "work week."

□ The Smart Valley study also showed that it is essential

for teleworkers to log their hours and output against pre-set goals. Companies also need to measure their overall performance, based on sales and operating profit, set against goals, plus cost-studies, based on equipment, occupancy and communications costs. There should also be a quality of work review.

□ Companies have also tended to benefit by reductions in office space. These have averaged 33 per cent, with the economic gain, depending on location, ranging between

\$1,500 to \$6,000 per teleworker.

Despite these potential benefits, Mr Unsworth admits that the spread of teleworking will probably be much slower in Europe, as external demands for creating the necessary infrastructure are nowhere near as strong. "I think from a European point of view it will take longer than most people have predicted," he concludes. "The Smart Valley initiative, for example, was driven by environmental legislation."

■ **Virtual private networks** – VPNs offer more solutions for multinational corporations, reports Alan Cane

A key competitive factor among telecom operators

Business customers expect advanced connection facilities provided by VPN systems

The ability to offer virtual private networks nationally and internationally has become a key competitive factor for the world's leading telecom operators. Over the past three years, they have been grouping themselves into alliances with one purpose only: to become the most successful telecommunications "supercarrier" able to provide international business customers with seamless communications services.

The most advanced of these alliances is Concert, owned by British Telecommunications and MCI of the US. It operates world-wide and claims to have signed up 100 big new customers last year and to have \$500m worth of contracts.

AT&T, the largest US long

distance carrier, is at the head of a loose association of telecom operators called WorldPartners. The list includes Unisource, an alliance between the Dutch, Swiss and Swedish national operators.

Phoenix, a proposed alliance between Deutsche Telekom and France Telecom and Sprint, the third largest US long-distance operator, already seems to be falling foul of the regulatory authorities in Europe and the US and may not be able to make much progress before 1998, the year designated by the European Union for the liberalisation of telecom services and infrastructure in Europe.

While not on the same scale as the big alliances, Cable and Wireless, the UK-based operator with substantial interests in the Asia Pacific region has ambitions as a global supercarrier. Essentially, global supercarriers will provide their customers with outsourcing services. For a fee, they will manage their international

voice and data traffic. A significant element in this is the provision of international virtual private networks.

What is a VPN? It is the provision of a national or international private voice and data network service using advanced public switches to route the traffic through the public switched network.

The cleverness in the system resides in the switch, essentially a large computer, whose software is programmed to set up the necessary connections. Rather than establishing a fixed private network based on leased lines, a VPN uses the public network, setting up connections only when required but providing a range of advanced facilities which are not available to the general public.

There are two principal benefits to the business customer.

First, they are a cost-effective alternative to a leased-line network of equivalent capacity, especially in countries where leased lines command

high prices. Second, they allow a broad range of advanced features to be offered across an entire organisation, even to parts of the organisation where establishing a leased line could not be justified on grounds of cost.

At the international level, where Concert, WorldPartners and Phoenix are focussing their efforts, the concept can be extended to create a global network with the features and functionality of a national VPN. These features include dialling plans, or company wide unique extension numbers, closed users groups, calling line identification, high capacity data channels and call forwarding.

What are the advantages of VPNs compared with private leased line networks which could offer the same features?

Telecommunications managers know that building an international network is slow and difficult. Agreements have

to be hammered out with a diversity of national carriers and administrations. Technical problems are legion. Interconnection of different kinds of technical equipment can be a nightmare. Once the network is in place, management and maintaining the system becomes the manager's greatest headache.

According to Cable & Wireless, "many multinational corporations are increasingly looking to reduce their management investment through a single arrangement with a managed network supplier rather than continue to support all the cost of an open ended commitment to a private network. An IVPN provides international companies with the option to move transparently to supplier management while still retaining a high degree of control over their global networks."

An example is Lucas Industries, a UK engineering group, with offices in the US. Last year it signed an IVPN deal

with Mercury, the UK's second largest telecom operator, worth \$5.3m over three years.

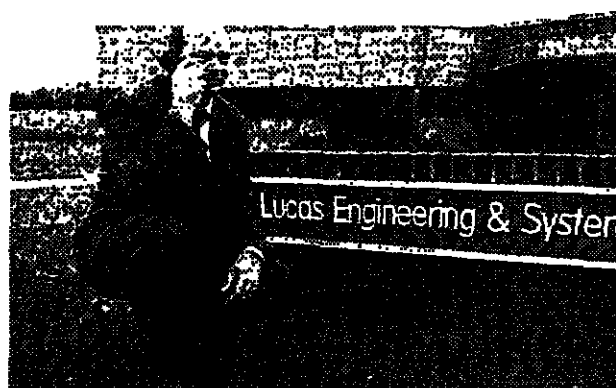
The network now connects 60 sites in the UK and in the US. The company had been operating a private voice network but structural changes in its business were making it less effective.

First, it had moved to a larger number of smaller sites, and it was uneconomic to connect many to the network using leased lines. Only 48 sites out of a total of 145 were connected.

Second, the company used profit-centre based accounting techniques and it was becoming difficult to charge back telecom costs to the business units.

Third, there has been a sharp shift in the balance between the cost of public network calls and leased lines.

"The cost of a phone call has fallen dramatically, but fixed circuits which make up a private network have not seen a similar decline. As a result, the



Steve Hudson of Lucas: "Cost-savings on calls are evident"

private network no longer represented a financial benefit," according to Mr Steven Hudson, VPN project manager for Lucas Engineering & Systems.

Mercury was selected as supplier in September 1993, a pilot ran between October and December and cut over from the old network to the new took place between January and July last year.

Lucas seems happy with the results. Mr Hudson says: "Usage-based charging has been a great success, cost-savings are evident and more people are able to use private

network functions. "There are benefits which are less obvious to our end-users but perhaps more important to the telecommunications manager."

"Reconfiguring the network, for example, to take account of organisational changes can be done with a great deal less management time – general network support – now the responsibility of Mercury who have all the people in place to make sure it happens 24 hours a day."

Outsourcing report: page 10

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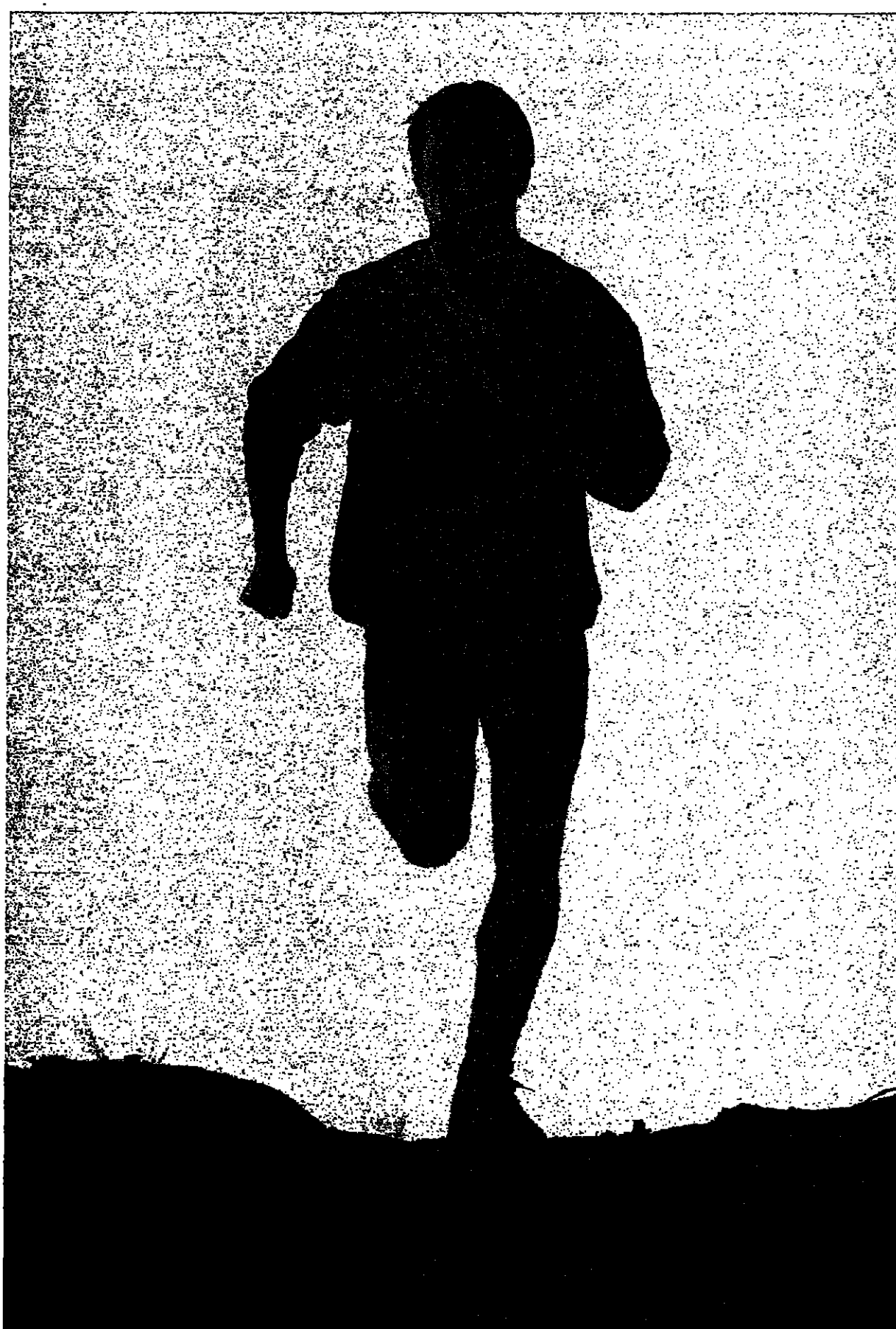
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6 IT focus: networking

Fibre optic communications - Light means speed, reports Michael Dempsey

Propelled to prominence

The principle of fibre optic communications is perfectly suited to the information age

Data, converted into a light beam, can be flashed down a microscopic glass tube that is manufactured as a strand of fibre. The fibre itself is twisted around other strands to form a stretch of cable that easily outperforms traditional copper cabling.

Light means speed, and high-speed networks are necessary to match the pace and power of an IT industry that is finally catching up with the real needs of users through potent hardware running resource-hungry software. Optical fibre is the means of high-technology networking, namely bandwidth. The more bandwidth you have, the more data you can deliver. More importantly, bandwidth equals the ability to transmit a mix of information in the form of voice, video images and data. This dovetails neatly with the rise of multimedia.

Optical fibre links are more expensive than copper cabling.

And the gradual replacement of telecoms lines with this technology will stretch into the next century. But the unique properties of the optical fibre link have propelled this technology to prominence in certain applications. Security is a huge by-product of data transmitted as light. Optical fibre links can be monitored, but it takes a huge effort compared to copper wiring. This attribute has not been lost on the military.

The UK's Ministry of Defence relies on fibre optical cabling for its £10m Corporate Headquarters Office Technology (Chots) network. The 5,000 users wired up to Chots have a very fast data network, while their management know they have opted for one of the most secure networking technologies available.

ICL, the British-based IT company owned by Fujitsu implemented Chots. Chris Reeves, an ICL infrastructure design manager, has witnessed the rise of the fibre optic network - "several years ago the technology for converting the signal at the terminating end, the receiver, was cumbersome. Reliability was poor and losses of data were frequent," he

says. Connections have much improved and Reeves finds himself facing a different dilemma. The demand for the raw material at the heart of these networks, the fibres that carry the light signal, has outstripped supply. Last year ICL found itself scouring the globe for manufacturing sources.

The high-tech sector works hard at portraying a self-image of progress at the frontiers of science. But many of the problems it solves are staggeringly banal. Copper is prone to interference from other sources of electrical energy. But this conflicts with obvious routes for internal networks.

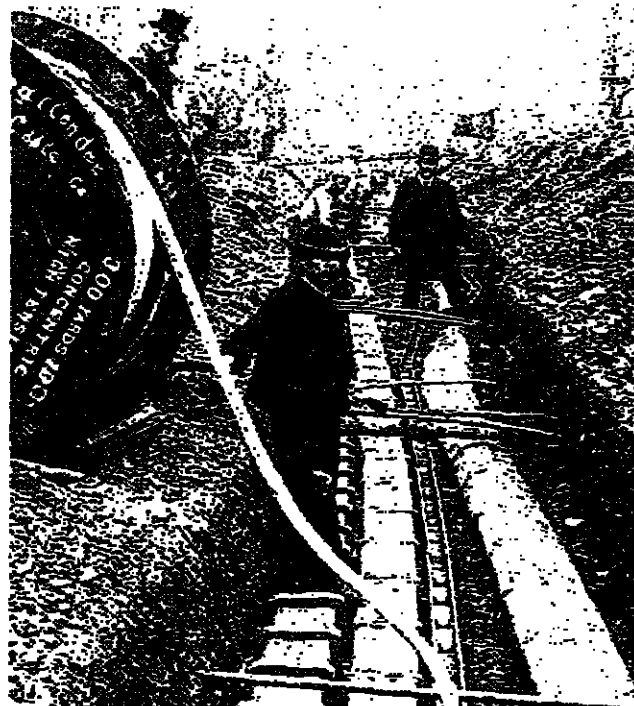
The Korean car-maker, Daewoo runs computer network cabling up the lift-shafts of its UK headquarters on the outskirts of London. The normal activity of an elevator service could interrupt data signals utilising conventional cabling. So Daewoo called in computer systems supplier Data General to provide a reliable data infrastructure.

Data General installed a £500,000 network that utilised copper cabling to carry data

across each floor, on a horizontal basis. The vertical element of the network relied on optical fibre signals travelling up the lift-shaft, but impervious to induced noise and electrical interference.

Mike Flatman, a network services specialist with Data General, explains that the two technologies make for a practical partnership: "Telephony is moving to fibre for lines outside a building, but copper is still a sensible choice within a site. It is cheaper than fibre. A fibre optical network can be double the cost of copper lines."

According to Mr Flatman, it is human skills rather than raw materials that push up the price of optical fibre. British Telecom harbours grand ambitions to create an optical fibre network stretching across Britain. The objective is to create a society where multimedia transmissions can be translated into their ideal communications format. This is Asynchronous Transfer Mode (ATM) and allied to fibre optics it promises to leverage BT out of the old world of the telephone company and into a new role as mass data conveyor.



The technology of yesterday: cable-laying in the streets of Britain in the early 1900s - a technical marvel in its day

One company cashing in on the migration to fibre optics is Metropolitan Fibre Systems (MFS). Its nine-year history reflects the rise of this technology. MFS has run fibre optic links into 40 US cities and now operates in London, Frankfurt, Paris and Stockholm.

Financial market news pro-

vider Dow Jones Telerate employs MFS fibre optics to distribute its business TV service in London. DJT's clients are finding planning permission for satellite dishes increasingly hard to gain, so transmission down fibre optic lines was more attractive than using a satellite signal.



Optic fibre cables being checked by a BT engineer: the fibre network can carry television, stereo radio, phone calls and other IT services

Mike Hooley, head of network development for MFS in the UK, is now anticipating the next step in fibre optics - photonic switching.

Currently, the light signal on a fibre optic line needs regular re-amplification. In order to do this it must be converted from light back into an electrical

signal. Photonic switching promises to deliver even faster switching of data by magnifying the signal and cutting out this regeneration process.

It is a long way from commercial application, according to Hooley - "using photon particles will be more efficient and reliable, but at the moment it's something that flounders in a

A proliferation of peripherals - Networked printers, scanners and fax equipment - An update by Joia Shillingford

Stronger emphasis on ease of use

Multifunction network machines that print, copy and fax are coming to the market

Local area networks (LANs) came into being so that users could share costly peripherals such as printers. Today, falling prices and a wider variety of products mean that companies can afford to plug far more into the LAN.

Printing from PC networks:

Three key trends characterise the market for networked printers: greater ease of use; better network management; and lower prices for colour. Hewlett Packard (HP) says its colour and monochrome laser printers, and high-end inkjet printers can be plugged into just about any network.

"With the new emphasis on ease of use, when you connect one of the latest printers into a network, it announces itself to the network and configures itself," says Mr Malcolm Hancock, a senior industry analyst at Dataquest.

Mr Martin Hurren, a spokesman for HP, says the company is providing better network management through its JetAdmin software. This comes with all HP printers bought with a network interface and enables a network administrator to monitor and configure printers from a remote per-

sonal computer. The software also makes life easier for users by helping them to send their print jobs to the right printer on the network, for example, one which has A3 paper, colour, the right typefaces, or the right amount of memory. And it tells them when the printer is out of paper. JetAdmin will be bundled in with Windows 95 (the next version of the Windows graphical user interface).

Today's networked printers can be shared between very large groups of people. For example, all 100 people in the UK office of market analysts Dataquest can access any of the printers on the network.

In addition, throughput is very important. A fully networked, 600 dpi, 16-page per minute (ppm) HP laser printer supporting 12 (or more) users costs around £3,500, according to Mr Hurren. For smaller groups of 5-10 users, 12ppm is probably adequate.

Hewlett Packard is the market leader in the networked printer market (apart from high-speed machines printing over 50ppm). Last year, HP had a 36.7 per cent market share of all printer types, according to Dataquest, with no competitors approaching this figure. Other networked printer suppliers include Brother, Apple and Lexmark (formerly part of IBM). Mr Hancock says Brother is in a strong position in the UK with products ranging from personal printers to

12ppm network printers with 600 dpi.

Apple is also doing well, partly because it has a loyal installed base of Apple Macintosh users, but also because its products are selling well into the PC and network market.

Lexmark introduced a new range of products called Optra earlier this year including networked laser printers with a print quality of 1,200 dpi and Mr Hancock is expecting this to contribute to "phenomenal year on year growth".

Graphical device interface (GDI) laser printers are also becoming available for PC networks. These print directly from the Windows page description language (unlike HP printers which use the PCL printer control language) and tend to be cheaper than PCL-based machines.

For example, NEC of Japan says its SuperScript 690 is a fully networkable printer, not only for the GDI Windows environment but for all other PC-based networking in medium-to-large organisations. It costs £799, and includes a 200-sheet hopper and built-in PCL5e emulation.

There have also been some changes in the market for 50 ppm-plus printers. Alan Sutcliffe, support manager for high-speed printers at Siemens-Nixdorf, says: "We've seen a remarkable swing towards network printing, especially at the

high end. Many people are moving high-speed printers away from mainframes and breaking them off into separate networks. The printer network can then be given instructions (for example, for printing, mailing and enveloping) by users on other company local area networks, perhaps at different sites."

More scope for scanners: It is much harder to instruct scanners from a network - "scanners cannot be plugged into networks," according to Mr Hurren. But this is likely to change within a year as new products come to market.

At present, office scanners plug into a single PC. In the future, it will be possible to plug a scanner into the network, so that any user can walk over to it, scan in images and route them to his or her PC. Popular uses for scanners include optical character read (transferring text on paper on to a PC screen) and scanning in photographs, pictures or logos.

However, Mr Hurren (previously HP's scanner manager), says a colour scanner can also be used as a cheap way of providing colour photocopying. A colour flatbed scanner from HP costs £839 (exc. VAT) and a black and white scanner costs £430.

Scanners have been designed to be as easy to use as photocopyers. When the user wants to use the scanner for copying, a set of controls (similar to

those on a photocopier) is displayed on his or her PC screen.

Slow take-up for PC fax: Scanners are particularly useful for scanning in company logos, which can then be used on computer-generated faxes. In a 1994 Dataquest survey of 355 European users, more than 50 per cent of those not currently sending out faxes from PCs, said they would prefer to do so via a network fax server instead of via a modem (a communications device) directly connected to or inside their PC.

The users considered networked fax solutions to be cheaper and easier to use. Only 21 per cent said that they would choose fax modems in the PC. Delrina's Winfax Pro software was the most popular PC fax software among the survey sample. Take up of PC-based fax is still low. However, 36 per cent of the survey sample said they would buy a solution in the next 12 months.

But in the next few years, the trend towards connecting more and more peripherals to the LAN could be reversed. This is because a growing number of machines combining more than one function are coming to market. For example, Rank Xerox's digital copier-cum-printer-cum-fax for networks is out this month. It is likely to be the first of many such networked products offering printing plus photocopying and/or faxing.

Technology of high promise

The next generation of enterprise-wide computer networks will need to be able to carry all an organisations' multimedia electronic traffic including voice, data and video at very high speeds to the desktop.

Many existing local area networks (LANs) based on the standard four, 10 or 16 megabits per second transmission speed of standard Ethernet and Token Ring LANs are already creaking under the load generated by faster PCs and network servers, larger files and more complex applications.

Emerging data-intensive applications and technologies such as multimedia, groupware, imaging and client-server databases will soon make 100Mbps networking running on an optical fiber backbone a necessity.

There are a number of enabling technologies including the various varieties of Fast Ethernet, Fibre Distributed Data Interface (FDDI) and Frame Relay capable of delivering such additional bandwidth and performance.

However, it is generally agreed that asynchronous transfer mode (ATM) is the most promising. ATM technology will increase transmission speeds initially to around 155Mbps but in the long term could push transmission speeds up to as much as 622Mbps - "ATM is

likely to revolutionise the computer networking industry and the boundaries between computer and telecommunications networking," says Robert Madge, founder and chief executive of Madge, the computer network specialists.

ATM is an advanced packet-switched technology based on international standards which converts data into short fixed-length 'cells' each containing 53 bytes which can be transmitted at high speed to form a 'virtual circuit'. Since packet size is fixed switching can be done entirely in hardware which is much faster than software switching.

This system allows very high speed switching with negligible delay and constant time intervals between cells - features which are crucial to real-time voice and video.

ATM is ideal for a wide range of applications including traditional data communications, imaging, video and multimedia, says Price Waterhouse in its latest Technology Forecast.

"Of all the switching technologies, ATM is the one that holds the promise of handling all types of traffic well and providing a common telecom architecture in public private and premise networks as well as in the home," says the forecast.

Most networking product manufacturers including Fore

Systems, Newbridge Networks, General DataComm, Cisco, Bay Networks, Digital Equipment together with StrataCom and Northern Telecom already have ATM switch products on the market. Some telecommunications carriers, including AT&T and Sprint in the US, are offering their customers services based on ATM technology, although widespread deployment in the public network will have to wait until at least 1997 after inter-networking standards are worked out.

Just how quickly ATM technology is adopted by corporate customers for their networks is a matter of considerable debate. John Chambers, Cisco's chief executive, says: "It is widely believed that gaining the benefits of multimedia means making a massive investment to deploy emerging high-speed technologies. But multimedia applications can be delivered today without a huge new resource commitment... ATM high-speed switching and other advanced technologies can be brought into the blueprint when appropriate."

Nevertheless, with ATM equipment prices already tumbling, most analysts are forecasting a rapid take-up of ATM technology, particularly in the US. Michael Beardsley of Merrill Lynch predicts that the ATM equipment market will grow from \$165m in 1994 to \$2.3bn in 1997.

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Communicating through technology **RACAL**

■ **Mobile communications** — Radio links with small PCs: an update by Tom Foremski in California

Visions of the future

At least \$50bn is likely to be spent on building personal communication service (PCS) networks in the US in the next few years

A vision of messages falling out of the sky and into small, portable computers is what Bill Atkinson, chief scientist of California-based General Magic, sees as becoming a reality in the near future.

It is a vision that many users of portable computers share. After all, what is the point of a portable computer if you cannot use it to communicate with colleagues and send and receive information on the move? Today's computers have outgrown the "personal" tag and have moved towards becoming communications devices, a feature even more important to portable computer users.

Mr Atkinson and his company, General Magic, are developing a communications technology called TeleScript that

can route messages along virtually any kind of communications channel to reach users of what it calls "personal intelligent communication devices".

These devices are distinguished from other similar portable, hand-held computers such as Apple Computer's Newton, sometimes referred to as personal digital assistants (PDAs).

"A personal intelligent communicator is closer to a telephone and e-mail than it is to a desktop computer," explains Mr Atkinson. TeleScript makes possible intelligent handling of messages, allowing the creation of software agents that can automatically sort e-mail messages, and can go out on their own to track down data from on-line services and bring it back to the user.

Part of General Magic's vision is already embodied in the Sony Magic Link and Motorola's Envoy product. The Magic Link needs to be plugged into a telephone line but the Envoy has a wireless link that uses the US-based Motorola and IBM-operated Ardis wireless network to carry e-mail messages.

Other types of portable computers can be equipped with wireless communications capabilities with the addition of cel-

lular phone links. However, cellular phone technology is still far from being a reliable data communications medium — "analog cellular phone technology has a signal quality one-tenth as good as hard wire. You can't put a modem on the cellular network and expect it to work as good as a telephone line," Mr Atkinson says.

However, digital cellular phone networks will offer better performance. The US government has allocated a narrow band of radio frequencies that will be used solely for digital communications known as personal communications services (PCS).

At least \$50bn is expected to be spent on building PCS networks in the US over the next few years. Federal Communications Commission (FCC) chairman Reed Hundt, called the investment "the greatest one-time private sector investment in any single industry in the nation's peacetime history."

When PCS finally arrives, mobile computer users will have access to high speed, reliable, wireless data communications. By the year 2003, the US-based Personal Communications Industry Association predicts that more than half the US

population will be using PCS, cellular phones, and paging services.

But there are still standards issues to be decided. For example, will PCS use a variation of the European Global System for Mobile Communications, or the Code Division Multiple Access standard? So far, leading US communications companies are pursuing different and incompatible strategies.

The beauty of TeleScript, Atkinson says, is that it is not reliant on the communications technology and thus might become the "glue" that could bind incompatible networks. TeleScript has been licensed to US communications company AT&T, France Telecom and Japan's NTT, so it has the potential to become a global telecommunications standard.

Many portable computer users are not going to wait for PCS. A study by market research firm BIS Strategic Decisions, found that about 3 per cent, or about 300,000 of US portable computer users had wireless data communications capabilities at the end of 1994. This figure, the firm predicts, will grow to 2.8m users or 16 per cent of all US portable computer users by 1998.

Much of this growth will come from more reliable wire-



Free entrance for Networks 95 Exhibition

Readers of the FT's Review of Information Technology are being offered free admission to the Networks 95 show at the National Exhibition Centre, near Birmingham, later this month, provided they produce a copy of this issue of the Review at the door. The event is being held from Tuesday, June 27 to Thursday, June 29. For more details, call the organisers, Blenheim Exhibitions, London, telephone: 0181 742 2828.

less data communications products and packaged systems for specific tasks. For example, Compaq Computer in partnership with wireless data network provider RAM Mobile Data, TeleScan, AT&T and Wireless Telecom, have created the Mobile Financial Workstation targeted at investors.

Using a Compaq Contura Aero notebook computer, equipped with an Ericsson wireless cellular data modem, users can retrieve financial data from virtually anywhere in the US. Through Telecom's online information service, they can track sudden stock market changes, receive news stories and download analytical information and trade stocks.

There is also another wireless data technology that provides faster data communications than cellular phone-based systems and could become a serious competitor to PCS. The US company Metricom is building its Ricochet Micro Cellular Data Network in five larger US metropolitan areas — Seattle, Chicago, Boston, Atlanta and Washington. These networks will be operating by the end of 1995 and will be expanded to surrounding areas.

Ricochet offers 100 kbps per second (kbps) communication speeds compared with 19.2 kbps for cellular data networks. Ricochet uses a technology called spread spectrum radio and does not require the

use of special PCS frequencies. Another advantage is price: Metricom plans to charge users a flat monthly fee of between \$3 and \$30, depending on how fast they want to communicate.

The higher data capacity of Ricochet also opens up wireless data networks to the transmission of large, graphics files, which cellular phone networks cannot handle easily. In addition, Ricochet provides an interface to the Internet and to private wide area and local area networks. It also does not require expensive tower-based radios to relay messages. Metricom says that its small toaster-sized radios can be easily mounted on telephone poles

and buildings to provide wireless communications over a wide area.

So far, the system has been tested in Silicon Valley where it has been used by companies to provide wireless data communications for both desktop and portable computer users within their campus area.

Ricochet works well, but for the moment it suffers from one key flaw in that it is slow at handing-off communications between different cell areas. This will make it difficult to use in a moving car. Yet its relatively low price is certain to attract portable computer users who do not want to pay a premium for mobile communications.

■ **Electronic data interchange**

Community spirit in electronic trading project

John Kavanagh reports on a pioneering EDI application among leading UK construction companies

Eight of Britain's biggest construction groups have united in the latest manifestation of community spirit in proposing electronic data interchange (EDI).

EDI is the exchange of documents such as orders and invoices between different companies' computer systems. Community action is gradually finding a place beside the "big stick approach" of the early days, when retail chains and car manufacturers forced their suppliers into electronic trading.

The new Construction Industry Trading Electronically (CITE) project went live in April after joint development and a modest combined investment of £30,000 by Alfred McAlpine, AMEC, Balfour Beatty, Costain, John Laing, Tarmac, Trafalgar House and Wimpey.

They invited seven material suppliers — ARC, Blue Circle Cement, British Steel, Frank Parker and Co, Graham Group, Greenham Trading and Pioneer Concrete — plus five quantity surveyors: C. E. Ball, Cyril Sweett, E. C. Harris, Gardiner and Theobald and MDA Computing.

The Cite community has started with the electronic exchange of invoices, using a simplified version of the international Edifact standard message, plus bills of quantity: here it has developed its own message, arguing that the complexity of the Edifact standard would hold back progress.

"An international standard has to be all things to all men," says Tim Cole, head of consultancy Interlock, which was contracted to manage the project.

"Trading partners still have to agree on its interpretation in their particular case. Instead, the Cite partners have taken a pragmatic approach and developed their own message structure and rules."

Pragmatic is a word much used by Cite partners. Some have worked on Edifact stan-

can dictate to its suppliers," he says. "The construction companies saw that electronic trading needed co-ordination at industry level so that it could get off the ground for the good of the whole industry."

The Cite partners point out that this thinking is in line with the recommendations of the recent report by Sir Michael Latham and the Construction Industry Board, commissioned by the government and by the industry, which made special recommendations on procurement, partnerships and reducing costs.

The Cite project worked with a relative newcomer to EDI in Europe, the US network services and software supplier Harbinger, to put together a software and service package which could enable companies to join quickly. The package is free for 60 days, then costs £295, plus £400 a year for maintenance.

Fees for the network service, which directs messages between trading partners, range from £20 to £30 a month. There is also a Cite membership fee of £100 to £350, depending on company size: this covers support and further development.

However, these items are secondary, says Mr Cole at Interlock: "Companies can use other networks. The aim is not to sell software and services but to get the industry moving on electronic trading."

The urgency of this call is underlined by Trafalgar House with the example of a trading partner which supplies it with protective clothing and sends it 13,000 invoices a year, mostly for under £100.

Along with other Cite members, Trafalgar House is integrating Cite with its corporate systems so that electronic invoices can be reconciled with orders and paid automatically.

The partners agree on the benefits, which are common to most EDI projects. Paper handling is eliminated: invoice details are no longer keyed into a computer, printed and posted at one end and then handled and keyed into another computer at the receiving end, with all the potential for human error. Information is available to both partners almost as soon as it is prepared by one of them, as postal delays are eliminated.

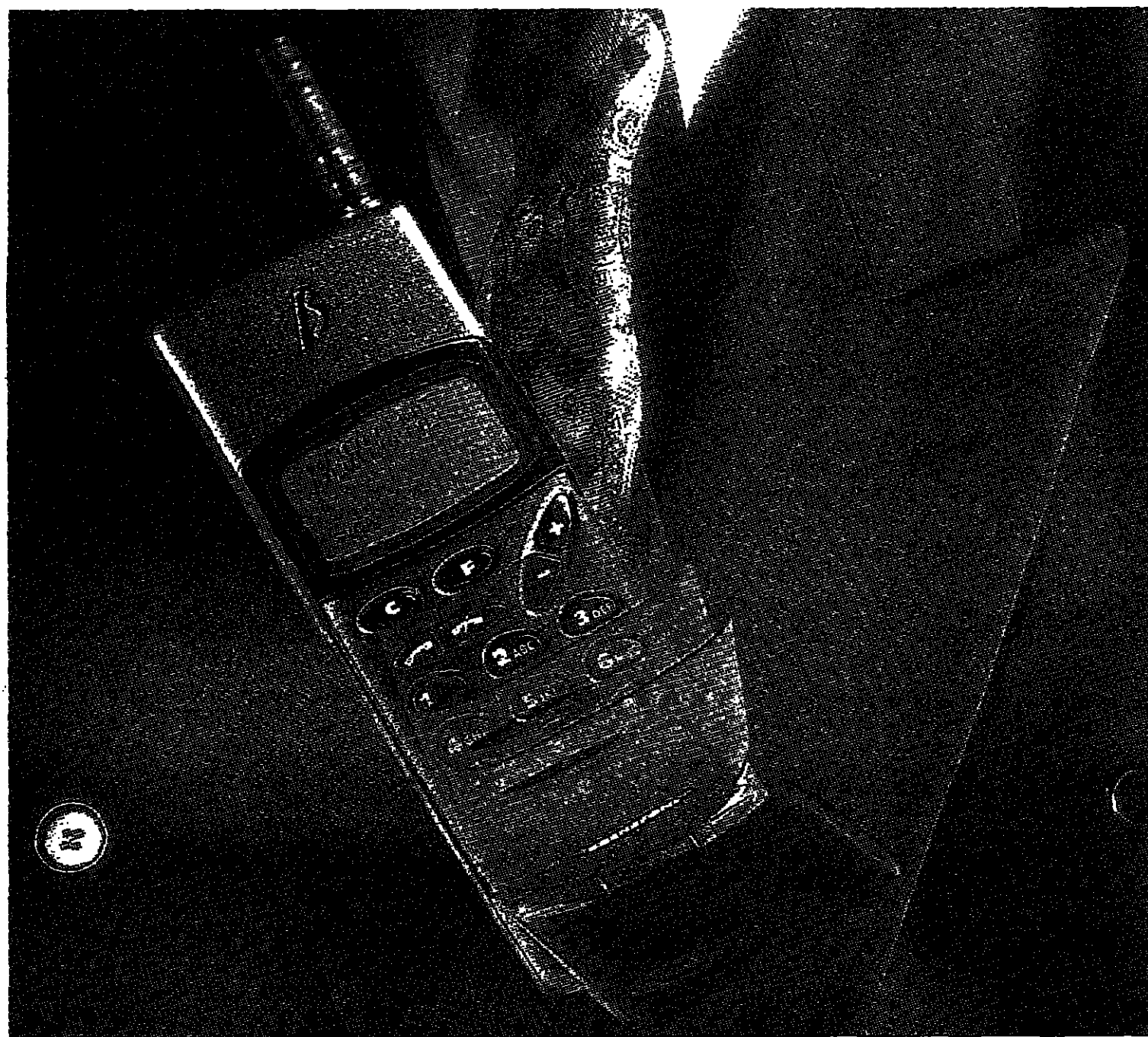
In addition, Mr Jones at John Laing points out that setting up electronic trading links demands close co-operation, to sort out the technicalities, so there is the intangible benefit of true partnership with customers and suppliers.

The Cite partners are already looking at more transactions, notably orders — and they are thinking big. Ideas here include links from sensors in cement silos at concrete products manufacturers back to their computer systems for automatic ordering via EDI to cement manufacturers when stocks reach specified levels.

The partners are also looking to expand the Cite coverage: they have done a mailshot to 600 companies, gaining 200 positive replies so far.

Project management report: see page 13

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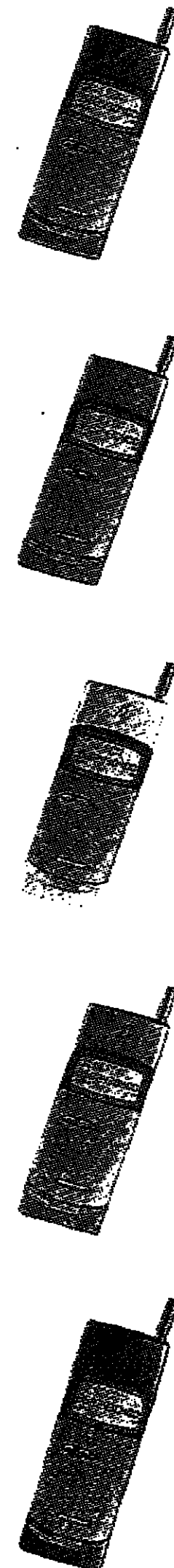
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CASE STUDY British Aerospace



Engineering and office staff at BAe use 10,000 personal computers, 1,500 workstations and 400 mid-range computer systems

Project rationalises a vast array of systems

Computer Sciences Corporation is a \$3.3bn company with a pedigree in outsourcing and systems integration that dates back to the era of the Apollo moonshots and computer management for NASA.

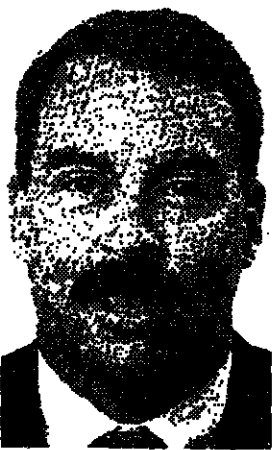
From April 1994, CSC took over responsibility for the computer operations of British Aerospace in a ten-year £1.2bn contract. This puts CSC in control of 10,000 PCs, 1,500 workstations plus 400 mid-range systems. BAe also contracted-out data centres running large mainframe computers and Cray supercomputers. These machines calculate fantastic permutations of data in massive equations that simulate problematic areas of design, such as airflow over aircraft surfaces.

One of CSC's priorities has been to rationalise the vast array of systems run by 1,500 BAe IT employees, spread across 14 business units, who now work for the US outsourcing contractor.

Mr Les Wright, CSC network manager for the BAe project, explains that after reducing the total number of data centres from 24 to 10, rationalising the internal data communications empire "was the second front in the war". CSC was confronted by what Mr Wright characterises as "Heinz 57 varieties of systems, vendors and protocols".

His reaction was to establish a network that accommodated the inevitable range of machines and programs to be found in a company the size of BAe while moving the entire community towards true inter-connectivity and information sharing.

BAe's original network



Les Wright, CSC network manager: a big task

was based on an IBM communications protocol, Systems Network Architecture (SNA). CSC took this structure and integrated it into a new arrangement using a tried-and-tested means of transferring data known as TCP/IP.

It may not be leading edge, and its success stands in direct opposition to the expansion of an EC-backed network protocol called OSI, but TCP/IP is popular. And this popularity means it works well in the commercial arena.

"TCP/IP is pretty much universal," says Mr Wright, "every vendor supports it, the Internet is built around it and as far as integration goes, we feel it gives us a platform in place that has worldwide acceptability."

The next phase of this ambitious data communications revamp is taking place at the local level of computing resource. The idea is to create a route out of every department into a company-wide data exchange.

Again, CSC has opted for a commonplace local area network design, Ethernet, that will accommodate previous methods of working while offering a corporate framework. BAe staff should find themselves migrating to the new network without any traumatic upheavals.

CSC has spent £2m on revising the network so far. Mr Wright reckons that it will take between £1m and £2m to complete the job. The objective is BAe's very own data superhighway that will allow staff to share engineering data and other critical project information.

With voice, data and video images flowing within the company, BAe will enter the world of multimedia. But CSC is pragmatic about this ambition. Mr Wright explains that while the software that will carry out complicated group working tasks is coming on to the market, not all of these elements are actually available yet.

With a systems integration contract that stretches well into the next century, CSC is planning for the long term. The IT industry is expected to catch up with this vision and deliver the final tools for the BAe project in the very near future.

Michael Dempsey

■ **Systems integration** - Wide area network projects demand a complex mix of skills, reports Michael Dempsey

A pivotal issue among users

Large-scale network systems integration 'still demands a lot of effort in backroom'

Computing is a critical and expensive business function. The last decade has seen a growing number of organisations choosing to contract-out all or most of their IT operations in a bid to control budgets through fixed contracts.

The largest projects demand a mix of skills that few contractors can provide on their own. Despite the best efforts of IT professionals any significant organisation acquires different systems as departments attempt to pursue independent purchasing policies.

This kind of autonomy is attractive to the users, but when the entire business needs to move on, it leaves the IT experts facing a nightmare of incompatible equipment and standards. Pulling these elements together has become a key mission in itself. So the booming market in outsourcing IT functions has spawned the discipline of Systems Integration (SI).

The effective SI contractor must strike a balance between obvious technical options and the desires and fears of the user community. Wiping out an entire infrastructure and starting from scratch might make sense to the networking specialist, but it will alienate end-users whose instinct is always to stay with the familiar.

Deutsche Press Agency (DPA) recently renovated its computer systems in an £2m project involving ICL, the UK systems company. DPA's staff were happy for the outside contractor to install state-of-the-art computer systems to route data signals within the Hamburg headquarters. But they refused to part with cherished terminals that have sat on DPA desks since before the era of IBM-standard PCs. These machines are antiquated by any standards. But they are customised for news writing and provide specific editing commands that are tailored for DPA's 300 reporters.



As information technology spreads throughout the business world, systems integration demands a growing mix of support skills

They wanted a complete new system but they had to keep those edit commands!

The standard desktop PC now packs enough processing power to supervise traffic management on local data networks. Dedicated network workstations have taken over the role of mid-range computers that would cost upwards of £100,000 to install. Open systems, the ability of software

from different sources to run across every item of hardware, is taken for granted. Why should integration still present problems?

John Smith, director of global network services for the European arm of outsourcing and SI giant Electronic Data Systems (EDS), has experienced the gulf between theory and practice in connectivity.

"To me, it's a fallacy that

open systems means open connectivity. Open systems have been fine from the users' point of view, but wiring up a large network still demands a lot of effort in the backroom," he says.

Smith acknowledges that almost every contract contains some disparate elements that are not suited to large-scale integration - "inevitably there is some clash between our desire to tie the client's systems together and the existence of some proprietary product that won't fit in".

But the customer must be appeased - "we try to provide all of the service to everybody that they claim to have received from the original set-up".

Hitachi Data Systems are a typical EDS SI client. Smith oversaw the implementation of a new European network for HDS.

"We had to move them to a better platform while consolidating and improving services," he adds.

Smith pours cold water on the idea that an international data communications web can be installed and activated at the flick of a switch - "it would be the best thing in the world if you could change over

at a given second, on a given day. But in reality you change the network connections one at a time and migrate over an extended period," he says.

Technology is just one issue facing the SI contractors. The European Union's Capital Adequacy Directive is due to be implemented by central banks from January 1 1996. This stipulates standards of risk management.

EU Banks are evaluating their reporting systems and commissioning urgent upgrades. Syntegra, the SI arm of British Telecom, sees Capital Adequacy as a question of converting and delivering information into one central model almost instantly. It will be selling a network control program that promises to govern this tricky process and allow banks to meet regulatory pressures. This suite of software does not have a name yet, but the price tag indicates just how pivotal network SI has become. Syntegra will release it for between £500,000 and £5m. If the data communications experts have got it right, this will be the cost of real-time reconciliation in the banking community.

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World Trade Centre.

THE FT REVIEW OF Information Technology

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■ **Network management** - Companies face increasing risks as their networks become more complex, reports Nuala Moran

Problems can grow as networks expand

IT support is not the end of the networked systems cost story. Failure in any part of the network can result in lost business

The growth of open distributed computing has put power in the hands of the end-user and made the business of managing and controlling networks immeasurably more fraught and complex - fraught because the computers are running applications that are critical to a company's success and competitive edge, and complex because the networks link an array of products from a variety of vendors, different technologies and multiple applications.

In short, the proliferation of distributed computing has exposed organisations to a higher level of risk, just at a time when it is becoming increasingly difficult to maintain control.

One of the paradoxes of the age is that as computers have fallen in price, computing has become much more expensive. As Robert Aitchison, network services marketing manager of

Siemens Nixdorf Information Systems puts it: "The explosion of client-server computing has been fuelled by the apparent affordability and seductive simplicity of local area network systems in comparison with central mainframe-based systems."

Recent studies by Gartner, the market research group, show that the capital cost of a personal computer connected to a local area network accounts for only 15 per cent of its annual cost. The remaining 85 per cent is attributed to support costs. Gartner quotes average annual operating costs of £5,400 per personal computer of which £4,600 goes on support.

Mr Aitchison points out support is not the end of the networked systems cost story. Failure in any part of the network can result in lost business.

There is no relief for companies which would like the world to stand still while they get to grips with the infrastructure, back-up and support issues, because the complexity of networks is poised to increase still further.

In recent research carried out by Unisys, the computer and information management company, on the networking needs of leading UK organisa-

tions, almost 100 of the 136 sampled said they are planning to roll out a mobile computing strategy over the next three years.

Mobile and remote worker need to access applications such as electronic mail, sales enquiries and order-processing using mobile phones and laptop computers which have been properly integrated with the corporate network.

Mr Peter Burke, network marketing manager at Unisys says: "As companies move closer to the customer, the technology goes to the edge of the enterprise. But although the end-users are 'computer literate', they can't be expected to look after the equipment in the back room."

At the same time, computer applications which serve the customer must be up-and-running all the time or the company cannot transact its business.

In addition, however, companies try and divide responsibilities, most businesses do not have enough skilled networking staff.

Gavin Roach, IT consultant in IBM's client-server organisation agrees - "the users may have all the power, but it's no good expecting them to do back-ups," he says.

Mr Roach believes that after a sharp move away from centralised to distributed control of networks, the pendulum is now swinging back. He quotes an engineering company which replaced Cad-cam (computer aided design and manufacturing) terminals - linked to a mainframe - with Sun workstations on every desk. To manage data flows, these workstations were linked to local

Many companies, defeated by spiralling costs, are outsourcing their network management

area networks (Lans). It was then realised that back-ups were not being done and different parts of the organisation were on different software releases.

Lan servers were introduced to manage these processes. Soon it made sense to locate all the Lan servers in a single location and the responsibility for them was handed back to the IT department, giving the company the best of both worlds.

"Companies have got to stop

this being a fight over territory," he says. "There are business choices to be made about what is managed centrally - and what is managed in a branch. There's no point in going to the centre to register a new user on a local area network."

"However, it is appropriate to have one central copy of the organisation's data which every branch has to refer back to."

There are now plenty of moves in the marketplace to bring back the consolidated approach to the management of networks and computers, says Robert Elmsley, software marketing manager for workgroup computing at Digital.

The users' dream is of a single view of their networks which will allow them to manage all aspects simultaneously from a single workstation. These include: the physical network, network traffic and devices such as hubs, bridges and routers (in other words, traditional network management); computer systems attached to the network and the distributed applications running across the network.

Products such as Hewlett-Packard's Openview, Sun's Net Manager and IBM's Netview (which is also sold by Digital),

provide part of the answer. These tools are promoted as being open, allowing software vendors to interface their applications but as yet no network management product provides a view of the whole network through a single interface.

In February, Hewlett-Packard announced its Framework programme under which it will make strategic agreements with software companies such as Oracle, Computer Associates and Legent to integrate their management environments into Openview.

"In future, there will be one interface and an end to arguments about who owns a problem," says Yolanta Palecka, HP marketing manager for Openview.

A British company, Microbase of London, claims to have developed a packaged software solution for supporting and backing up distributed corporate networks.

Its product, Netcool/Omnibus provides an enterprise-wide view of network fault status, collecting information from other network management systems such as Open-

Continued on next page.
Outsourcing and buying-in IT services: see next page

■ **Data protection on networks**

Anxiety rises over security

Louise Kehoe on problems emerging in the on-line business world

The popular picture of a computer hacker is that of a pimply youth who gets his kicks out of breaking into private computer networks and leaving offensive messages that pop up on users' screens.

The truth is more sinister. According to computer security experts the latest generation of computer hackers, or "crackers", as they are known in the trade, are motivated by money rather than technical challenges. They are intent upon stealing valuable information such as credit card numbers, or conducting industrial espionage.

While internal computer security can be controlled by limiting access to information on a "need to know" basis, it is far more difficult to protect corporate data from external incursions once a company's computer network is linked to the outside world, via the Internet.

Yet business use of the Internet is growing rapidly. In January, there were 1.3m computers on the Internet registered to companies, an increase of 132 per cent over the previous 12 months.

To protect internal networks from unwanted incursions, many companies deploy "firewalls", or access control systems, that sit between the public network system and their internal networks. Firewalls allow network traffic to pass only according to an organisation's pre-defined security policy.

Companies that install the latest firewall systems can be reasonably certain that their internal systems are secure. However, just as thieves become smarter at defeating new types of locks, so computer hackers work at penetrating new firewalls.

Another essential part of computer security, therefore, involves keeping up with the latest "upgrades" and "patches" that are regularly issued by computer and software companies in response to the hacker incursions.

There are other problems emerging in the on-line business world besides protecting the data on private networks. These dangers include competitors or hackers, stealing, diverting or altering electronic business information that is transferred via the Internet.

Thus, user-authentication, to ensure that a user of the network is who he or she claims to be, is also essential. Privacy of communications, using encryption, is also needed to enable users to send sensitive information on-line or to secure business transactions such as placing orders and billing.

A new approach to Internet security, recently introduced by Sun Microsystems, involves using a dedicated computer to secure networks. Called SunScreen, the system automatically encrypts data traffic between two similarly equipped networks without users being aware of, or able to prevent it.

In effect, SunScreen turns an

open network into a "virtual private network", like having dedicated lines," says Eric Schmidt, chief technology officer, Sun Microsystems, the leading supplier of Internet servers. The system uses a high level encryption algorithm that, if properly implemented, is "not breakable in our lifetime," he adds.

Businesses using the Internet must make decisions about security while also considering cost, efficiency and convenience," says Mr Schmidt. SunScreen is a maximum security system aimed at industries such as telecommunications, banking, health and government.

Unfortunately, US export restrictions limit sale of this version of SunScreen to US customers - except by special export licences that must be obtained for every overseas order. Sun is, however, developing an export version of the system that will incorporate the strongest encryption allowed.

A basic tenet of computer security is that organisations must carefully plan and implement links to the Internet. Yet in many cases, Internet access develops on an ad hoc basis within an organisation. One individual may arrange a hook up to the Internet and unwittingly expose the entire corporate network to potential risks.

"Computer security is lagging behind the implementation of new systems," says Daniel White, director of the Ernst & Young's information security effectiveness group.

More than half of the 1,200 US companies surveyed by Ernst & Young, the business consulting group, said that they had suffered financial losses related to computer security.

Even companies that have gone to considerable lengths to protect their internal networks from unwanted intruders cannot be sure that every computer containing their data is fully protected. A company may, for example, share sensitive information with a supplier, or customer, but it is difficult to ensure that that company's computer is properly protected.

The financial risks go beyond the potential loss of valuable data. Concerns are growing among US corporate computer managers about potential liability claims if, for example, an employee commits a crime on the Internet by breaking into another company's computers or distributing material protected by copyright.

By far the strongest motivation for Internet security is the trend towards electronic commerce. This goes beyond the consumer applications that are beginning to emerge in the form of on-line catalogues to include "business-to-business" transactions.

"People are not going to conduct business-to-business transactions over networks without serious security," says Mr Schmidt. "They are not going to take a chance with real numbers and large amounts of money for all of the reasons that you can imagine - liability, theft, industrial espionage... you name it."

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10 IT outsourcing

IT services - Computer companies are offering new-style outsourcing deals, reports Nuala Moran

Users take a tactical view

Cost-reduction remains the primary motive for companies using outsourced IT services

In February, Electronic Data Systems, the largest computer services company in the world, declined to bid for one of the most lucrative deals going in the UK this year - a £50m contract to look after the mainframe computers at British Gas.

"This was a hard decision to make because it would have been a significant chunk of revenue, but our future is not in this type of facilities management... it would have sent the wrong signals to our staff and the market," said Chris Stone, director of strategy and marketing at EDS.

Instead, EDS - now also the largest outsourcing company in the UK - is concentrating its resources on the next wave of IT service provision in which the provider helps to manage the client's business. This is seen as the logical progression from outsourcing in which companies buy an agreed level of IT services, and from facilities management which involves looking after a company's computers.

The first deals are being struck in this next stage of development which John Tilley, managing director of the Sema Group's outsourcing business, describes as "the move from tactical to strategic outsourcing".

Early examples of what is referred to either as "business process management" or "co-sourcing," are Andersen Consulting's contract with BP Exploration to run its accounting systems and do the accounts as well; EDS's deal with the Royal Bank of Scotland to handle all its cheque processing; and ICL's contract with London Underground to improve the transport company's service and business performance.

But, as yet, most companies take the tactical view of facilities management and outsourcing, seeing it as a way of cutting costs. An independent study of outsourcing in the UK, carried out by the Harris market research group, shows that cost-reduction remains the primary motive for outsourcing. Two-thirds of the 210 companies surveyed saw outsourcing as routine, connected solely to a reduction in business costs. At the same time, more and more companies are moving to outsource their IT services. A recent report by market analysts Ovum predicts that the European market will grow to \$17.7bn by 1997. This represents an annual growth rate of 16 per cent.

Mr Bill Lattimer, head of the UK outsourcing practice at Andersen Consulting, which commissioned the Harris report, says: "Despite this predicted growth, outsourcing in most companies remains low-key and purely tactical."

He argues that rather than just looking to reduce costs, companies should look at outsourcing as a way of improving



their business processes. This view builds on the work of C.K. Prahalad and Gary Hamel in *The Core Competence of the Corporation* (Harvard Business Review), which advocates that companies should identify and focus on the core activities they do better than anyone else, then outsource everything else to companies that excel in other areas.

"Bringing in an outside supplier to run functions such as accounting and customer services can improve the quality of overall service and, at the same time, allow senior management to concentrate more effectively on the organisation's core business," says Mr Lattimer.

In these new-style deals, IT suppliers are not just paid for delivering an agreed level of service - "in co-sourcing agreements, we commit to making a significant contribution to the business - not to reducing the

IT bill," says Mr Stone. Usually the cost of IT goes up, "but the difference it makes is enormous. Rather than cutting 10 to 15 per cent off the IT bill, companies should think about using IT to cut the other 93 per cent of their business overheads."

An example is EDS's deal with Kooperativa Forbundet, Sweden's largest retailer, in which EDS not only runs the computers controlling the supply chain, it also manages all the processes in the chain. Payments are based on reductions in the time goods spend in the supply system.

"Because we manage all the information from point-of-sale back through to ordering and restocking, we can reduce the product cycle time, which is of great economic value to Kooperativa Forbundet," explains Mr Stone.

In another co-sourcing contract with a US pharmaceutical company, EDS - which is owned by General Motors - is paid for reducing the lead time in introducing drugs to market. We don't do this by helping to discover new compounds, but by managing all the information flows involved in getting a drug through the approvals process.

An extension of this kind of contract is one in which the client merely specifies its objectives and has no involvement in deciding what hardware or software are deployed to achieve them. EDS has set up a co-sourcing agreement with the Dutch Rijkswaterstaat, the public body responsible for the waterways and roads, to introduce and run road tolling and traffic management systems in Holland.

EDS will be assessed not against how well the computer systems work but against objectives such as getting 5 per cent of the traffic off the roads, (working within a budget and the existing legislative framework).

This logic has been pushed even further in the contract for the development and operation of the new UK National Insurance Recording Computer system. In this deal, Andersen

Consulting will provide full funding for the project and in return receive payments linked to the volume of business handled by the system. This implies improving the efficiency of contribution collection, compliance and recording, and dealing with big changes to personal pensions legislation due to come into effect in April 1997.

Co-sourcing deals are also leading to the IT service companies managing business processes for companies in the same sector. Andersen Consulting now provides accounting services to several oil exploration companies through the centre in Aberdeen which was originally established to handle the BP Exploration account.

Meanwhile, EDS is looking for further cheque-processing business to go with its Royal Bank of Scotland contract, and has plans to set up processing centres in Livingston in Scotland, and in Milton Keynes.

According to Mr Tilley, the downside to this is that clients worry about possible loss of competitive advantage. This is why organisations need to be clear about what are core processes and what are not - "there is no competitive or strategic advantage in processing your own cheques," points out Mr Stone.

Managing another company's business processes implies that the supplier has a very close relationship with its client. Sema Group has a contract with Rascal Defence Systems which has matured from facilities management of mainframe systems to an agreement to provide Rascal with the best hardware and software for the next seven years - "you can't contemplate a deal like this unless you understand your client's business," says Mr Tilley.

EDS specifies that it must be party to the business strategy - "co-sourcing can only work where you're genuinely involved in all processes," says Mr Stone. He sees "the level of intimacy involved" as a barrier to the growth of the co-sourcing market - "this is a very difficult concept for a board of directors to digest," he says.

UPDATE New outsourcing deals and services

Siemens plans global project

Siemens is setting up a new global operation, Siemens Business Services, to tackle the surge in IT outsourcing business. The UK subsidiary, the first to be set up, will take over the internal IT function of its UK parent company Siemens Nixdorf Information Systems, along with the management of Siemens Plessey's computers.

The UK managing director, Graham Paxton (a former IT director at Sainsbury, the retail chain) says that Siemens already has a considerable outsourcing portfolio but because this is based on local contracts, the company does not have a reputation as a global outsourcing company.

The German arm of SBS, which will begin operations in October, will bring together all Siemens' internal IT, plus a number of external contracts. It will also take over the operation of the company's global private network, which connects more than 60 countries. From day one, SBS Germany will have nearly 2,000 staff and turnover of DM800m.

The new business will focus on vertical markets where Siemens has existing capabilities such as engineering, traffic and transport and hospital services.

Government contract

The first IT contract under the UK government's Private Finance Initiative has been awarded to Andersen Consulting. Under the agreement, Andersen will fund the development of a new National Insurance Recording computer system, known as NIRS2. The company will in return receive payments linked to the volume of business handled by the system, which is due to become operational in 1997.

The contract expires in 2004, but it could be extended by up to three years if merited by good performance. At the end of the contract, Andersen will own the



Graham Paxton, managing director of Siemens Business Services in the UK

system. NIRS2 will provide on-line access for 4,500 computer terminals in the Contributions Agency, which administers National Insurance.

The existing National Insurance computer, NIRS 1, was developed in 1961. It contains over 61m records and processes an average of 500,000 items a day.

British Gas deal

British Gas has awarded the outsourcing contract for its regional data centres to Cap Gemini Sogeti's UK subsidiary, Hoskyns. The contract, worth around £55m between now and the end of 1996, will involve the transfer of 1,500 staff.

In response to the opening up of the UK gas market, British Gas is dismantling its regional structure and reforming into five separate business units. Hoskyns will maintain and develop the legacy systems, while systems are developed to support the new business units.

Services for Adidas

Sema Group has won a contract worth £6.25m over two years to manage

computer services for the sports equipment company, Adidas. Sema says it will use the data centre, in Herzogenaurach, Bavaria to build its business in southern Germany, and it is already negotiating with other companies in the region.

This is a classic case of transition outsourcing: Adidas has done the deal to allow it to focus on a move to a client-server architecture. Twenty Adidas staff will transfer to Sema Group.

Meanwhile in the UK, Sema has taken over the IT operations of Bristol Water, originally outsourced to Hoskyns six years ago. The six-year contract with the company, which supplies water to a million people in and around Bristol, is worth over £5m.

Mainframe centre

Capita Managed Services has won a £7m contract to manage Westland Helicopters' IBM mainframe centre in Yeovil, Somerset.

Capita will use the site to develop an IBM business in the West Country and Wales. Staff at Capita's current IBM site in Trowbridge will transfer, and existing clients, including Wiltshire County Council, will be managed from Yeovil. The five-year contract includes a royalty arrangement under which Westland will receive a proportion of any revenue earned by Capita from new business it attracts to Yeovil.

Network management

The UK's Department of Transport has outsourced the management and supply of its data network to Mercury Communications in a three-year contract worth £330,000 a year. Nineteen sites around the UK will be directly connected; seven others will have dial up connections. This will link together a growing number of local area networks, allowing the DoT to run applications such as electronic mail across the country.

Continued from previous page:

view, Net Manager and Netview; Lan managers such as Novell's Netware or Microsoft's Systems Management Server; and mainframe and network monitoring systems.

The problem with these management tools is that they look at horizontal layers.

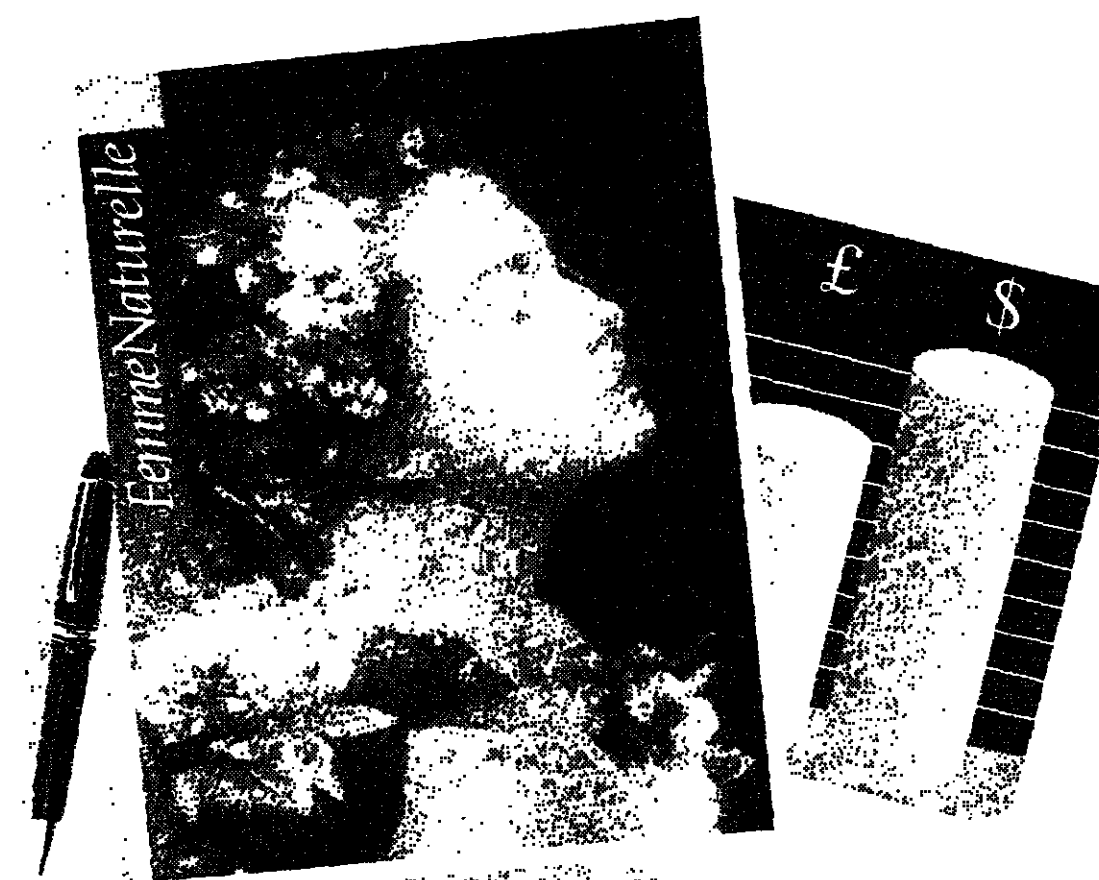
With Netcool/Omnibus you can view a vertical slice of the company - it gives you a

graphical representation of your business, not of your system," says Mike Silvey, software marketing manager.

Many organisations, defeated by complexity, spiralling costs, and shortages of skilled staff are outsourcing some, or all, of their network management. Some look for part-time network minders, according to Mike Valiant, managing director of the network services company, Ascom Timeplex -

"we take over at night, or we have agreements to fix a problem if the in-house staff have not found the solution in 15 minutes."

Other companies are aiming to get rid of the problem completely: a study by Hoskyns, the computer services company, found that a quarter of leading UK organisations expect to eventually hand-over network management to third parties.



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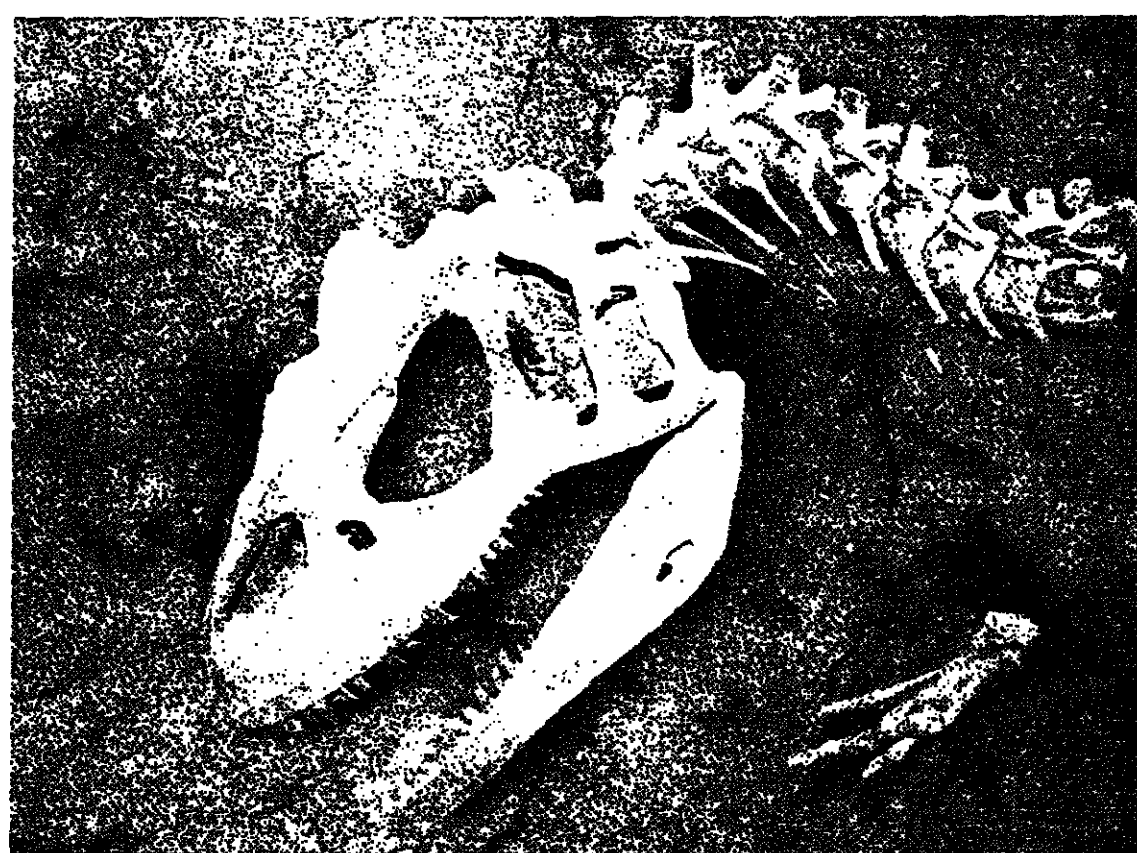
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Computer aided design

IT software at work

Saving time and money

Integrated software and virtual reality are poised to revolutionise the way construction companies design and test projects. But the transition will not be painless, says Claire Gooding

At the international engineering contractor, John Brown, design work is developed across three continents. The UK team, then the American, then the Asian, take turns to move projects forward, thanks to the co-ordination of design, drawing and project management made possible by workflow techniques.

John Brown's automated drawing package, AutoFlow, based on Autodesk's computer-aided design software, AutoCAD, not only reduces the time taken to produce piping diagrams, but also substantially improves quality and saves clients money. (Research has shown that differences in specification levels and in the use of standard components mean that raising a building in, for example, London's Heathrow, can cost 32 per cent more than it would in North Carolina.)

Sir Michael Latham's report on procurement for the UK government emphasises that a 30 per cent saving should be

possible by the year 2000, and many of the computer techniques pioneered by, and for, the construction industry have been put to work elsewhere. Among sectors using Computer Aided Design (Cad) and project management are the automotive and aircraft industries.

But in the construction industry, the use of Cad is somewhat limited. It remains an island of technology - a preserve of the architect's office that does not feed through to other disciplines in the sector. According to the international IT industry analyst, Dataquest, the Cad market is booming in Germany but flat in the UK. Dataquest's recent report* puts the worth of the Cad/Cam/CAE/GIS market in Europe at a third of the world's total at \$5.4bn. Cambashi, the Cambridge-based process industry analyst, estimates an end-user spend of \$450m on Cad/Cam/CAE tools in the UK alone, and a further

\$160m on Geographical Information Systems (GIS).

Ms Petra Garzen, a Dataquest specialist in Cad, points to the European Process Industries Manufacturing Advantage (Prima) project as an attempt to exploit the potential of Cad in a broader context.

"Business process re-engineering comes into the picture because people realise that in adopting these technologies, they have to adapt their processes. Design processes have not changed for more than 70 years in many companies," she says.

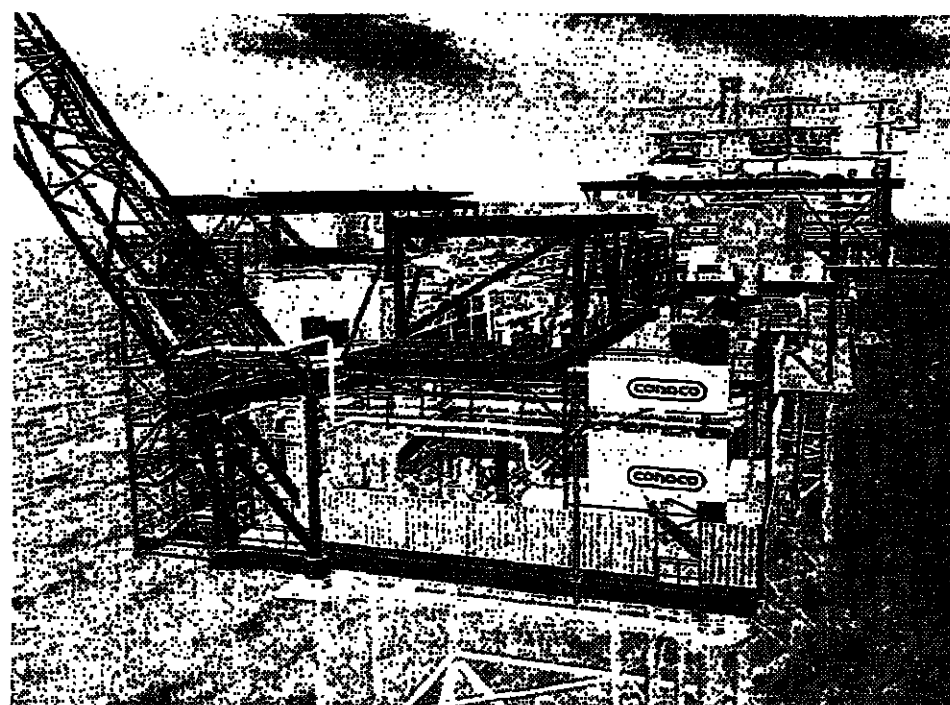
Dataquest's survey of users discovered disappointment in the ability of Cad systems to improve time-to-market, but the fault lies in the lack of integration between design and engineering departments, not in Cad, says Ms Garzen. She suggests that the CAD demands a change in attitude: a more thorough and co-operative

approach at the conception stage, and willingness to make basic design changes.

The wide availability of document management systems (DMS) and GIS offers the chance for Cad to be an integral part of the development process. Virtual reality and simulation techniques make it possible to "walk through" and test a drawing, before it goes to production. In this ideal world, designers and sub-contractors communicate easily throughout every stage, including maintenance.

In practice, exchange of information between CAD tools is usually possible, but often tricky, and a seamless flow between Cad and project management software rarely happens.

Some companies are trying to add finances into the picture, costing the components in the Cad drawing and modelling the financial implications of delays in the project management schedule.



"Visual engineering" - a realistic, three-dimensional model of a North Sea oil rig, produced with CADCentre software on a Silicon Graphics super computer. The system allows engineers to "walk around and examine components in a virtual world," say technologists at Cambridge-based CADCentre

Westbury Homes, the estate developer, (see report, page 12) had to write its own system to achieve an integrated approach since, according to Mr Neil Allen, a director, there was little specifically for its market. "There are islands of information," he says "but nothing to give the broad picture."

Mr David Jones, IT director of the Laing Group, a leading construction company, laments the fact that the courage - and government incentive - needed to "re-engineer" his industry and take advantage of imaging and workflow techniques are lacking.

"Cad demands a complete mindset approach," he says. "I believe we have to address design in the same way as process engineering: a building ought to be modelled in 3D, and simulation is vital."

"A client could virtually ensure delivery on schedule by insisting that every company in the process contributes to the preliminary design model, so that the complete model can be analysed, and any potential changes validated."

"But this is a risky investment for individual construction companies, and only one client - the government - is really big enough to make it happen. The UK has to take the initiative here: the US and

Japan are only a little way ahead of us."

It is possible that the world's largest software house, Microsoft, is setting in motion a change that will make such harmony easier to achieve. OLE 2 (the Object Linking Environment) is Microsoft's proposal for a common route to exchanging and managing data from all sorts of sources - spreadsheets, bit-map graphics, text - but also 3D objects, such as a 3D models, and vector graphics.

Yesterday, international industry analysts from the 100-strong group, CATN (Competitive Advantage Through Networking), met to discuss OLE and the issue of interoperability in Cad/cam and GIS.

Mr Mike Evans, founder of CATN and a consultant at Cambashi, believes that Microsoft's initiative is important, even though some might view it as muscling in to change the rules in an established market.

"Cad is a huge success, with proven productivity gains. Users are now seeking the 'value added' feature of interoperability so that the 50 or 60 specialist disciplines involved in one small project can be properly integrated," he says. Microsoft's initiative offers a

potential standard mechanism by which it might be possible to move the data from step to step - "a sort of integrated workflow from conception to design. Cad, project management and document management are all coming together."

Several independent Cad vendors support the OLE initiative, including its originator, Intergraph, Bentley Systems, and Autodesk, the Cad supplier with 70 per cent of the market.

"People are beginning to realise the investment they have made in their drawing files," says Mr Jeff Drust, managing director of Autodesk in the UK. "We have to interface with enterprise-wide systems such as those for document management, and increase people's ability to find existing files and re-use them. Revision control gives you a layer of management that enables simultaneous working - as at John Brown."

"The promise of Cad is to complete the design process, test, cost and validate it without ever spending money on a prototype. We make our mistakes on the computer rather than on-site - it's a lot cheaper."

*Dataquest Europe Perspective: Tel 00 44 194 423722 CATN, c/o Cambashi, 00 44 1223 460439

Complex task for a new German telecom network

Germany's population of 85m represents the most lucrative untapped market in Europe for cellular communications. Recent surveys suggest that only 2.5m people use cellular phones, which leaves the door wide open for E-Plus, the new German contender in this market. In setting up its network, E-Plus faces an extremely complex task - not least because it is starting from scratch. It has none of the infrastructure of the three established suppliers, which operate on the existing D-network, writes Claire Gooding.

The first step is to find out what has to be built first, and where. For this, E-Plus is looking beyond conventional

Computer Aided Design (Cad) tools to the extra dimension - literally an aerial one - provided by a Geographical Information System (GIS).

The ownership of the Dusseldorf-based E-Plus is shared between a group of multinational companies. Among them are the German companies, Thyssen (28.4 per cent) and Veba (28.4 per cent), the US company, Bell South (21.4 per cent), and the British network operator, Vodafone (16 per cent).

E-Plus, which won the government licence in 1993, plans to create a DCS1800 personal communications network that can support low-power 1-watt hand-held telephones across the country.

Michael Schnepf, specialist in net information systems at E-Plus, explains the technological problems: "We couldn't have used AutoCad or something similar because Cad tools just cannot marry the geographic and technical information. We needed multiple 'layers' of information about each area, such as population density, and so on, and a database that would provide different views and analyses - showing, for example, all cities above a certain population size."

E-Plus also needed a system with huge capacity - "an enormous amount of data volume is needed to map the entire country in digitised sectors," Mr Schnepf continues. "Because we are looking at the



The E-Plus personal communications network has been designed exclusively for low-power 1-watt hand-held telephones

height of the land and other factors we need lots of overlays - height of land, size of population, land usage, and so on. One layer is nearly 1 gigabyte: that is a lot of data when you consider the scale of the task."

It quickly became clear that to co-ordinate all the technical,

geographic and geometric information, E-Plus would need a GIS that was able to create maps using locational data, combined with statistical and text and numeric data. Of eight products originally evalu-

ated, only one was chosen. Continued on next page



Warehousing? Well, yes. But of information, rather than goods.

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12 IT software at work

The creative use of data

Continued from previous page

ated, only three survived to the shortlist and were deemed to match E-Plus's requirements for state-of-the-art programming techniques (object-oriented) and ease of use.

E-Plus chose Smallworld, a comparatively new but modern UK company, whose product was launched in 1991. Other products, although capable of handling raster data, adapted poorly to compare with information over the Wide Area Network (WAN) connecting E-Plus's nine regional offices.

In Smallworld's software, high-speed database cache facilities made this kind of reach much more practical. Another factor in Smallworld's favour was its interactivity, which made it easy to learn. "The Smallworld GIS is a young product, so it was difficult to compare its functions against other users: only three or four major companies used it at the time of the decision," says Mr Schnepf. "But with Smallworld you can make little

applications in a matter of hours: once you have learned the object-oriented way of thinking, then it's easy to exploit its facilities."

Local support, supplied from a Düsseldorf office, was a reassuring plus-point, but what clinched the deal was Smallworld's open approach to hardware platforms.

The system's ability to run on Sun, HP and DEC computers, (already installed at E-Plus) as well as on IBM and others, was an advantage to a company that used so many different planning tools on so many different computers.

With the Smallworld product, E-Plus can perform an analysis on each layer of data, seeing how many people each antenna will serve, and which have to be built first.

There are currently 1,700 base stations in place, and the number is expected to rise to 5,000-6,000, covering 98 per cent of Germany, by 1998. A separate Oracle 7 database stores all technical and administrative data for network elements

such as base stations and connectors. The link between Smallworld and Oracle enables E-Plus analysts to access information on the GIS seamlessly, so that the position of the antennae can be displayed along with transmitter sites, power transmissions and signal directions, clearly showing which areas are covered. The GIS also provides some operational and status information, for subsequent use in Microsoft's Project Manager software and other project management tools.

Smallworld's most creative business idea so far is regional charging, which, if exploited, would be unique to E-Plus in Germany, and give the newcomer a useful competitive lever.

It has further potential for building analytical applications, such as those showing demographic information with highways and signal strengths. Smallworld applications are also being used to design services for the automatic routing of emergency calls.

Computer aided design - New software systems help to preserve the past, reports Claire Gooding

Master plans for historic buildings

How computers help recreate architectural blueprints of 500-year-old buildings

When a basement was flooded in 1984, King's College Cambridge lost what few architectural plans it possessed. Restoration was a job for specialists and the Cambridge-based company, Annand and Mustoe Architects (AMA), was called in.

The architects' brief was to recreate internal records and floorplans that dated back to the college's foundation in 1441. (The famous Kings College Chapel was built between 1446 and 1515 and the Gibbs building, another well-known picture postcard subject, was constructed between 1724 and 1732.)

Recreation was essential if

the Domus Bursar at Kings (responsible for the care of the college fabric), was to have a "master plan" against which to plot routine maintenance work. For Mr Duncan Annand, partner at AMA, it was the first experience of Computer Aided Design (CAD) techniques. "When we first started the project nine years ago, we persuaded the college to let us do it on computer with the software product, AutoCAD," he recalls. "Unfortunately, as we did more of the survey, and the floor plans became larger, drawing re-generation took longer and the larger drawings could take several minutes to re-generate."

The architects then discovered FastCAD, a speedier solution available from a US company of the same name and written by the author of AutoCAD - "we had so many suggestions for improvements that we re-wrote the software with extensions for architects and engineers," Mr Annand adds.



The entrance to King's College, Cambridge, founded in 1441

"The survey has grown and grown - we've done seven-eighths of the college, although we haven't yet done the chapel. The whole idea is to make maintenance easier, but there's another long-term possibility: the technique opens up a way of putting maintenance on to a

facilities management package, a sort of computerised maintenance manual."

AMA asks other specialist companies to create the external elevations, using photogrammetry to convert pictures to two-dimensional plans.

The fires at Windsor Castle and York Minster - which had no architectural records - demonstrate how valuable such archives can be in the case of disaster.

Professor Ian Harley of the Photogrammetry and Surveying Department at University College London is working on a photogrammetry project for Henry VII's chapel in Westminster Abbey.

"Many buildings across Europe have been restored with the help of archived photographs, and architectural photogrammetry has been in routine use in Europe for some time," Mr Harley says. "Although the chapel has stood there for 500 years, no one has ever completely under-

stood the way the fan-vaulted ceiling is constructed. Computerised drawings can help."

Mr Nigel Lacey, domestic bursar at the college, finds the plans - which show phone, power and computer points as well as the historical details and can be printed-out at any size - as valuable for future planning as they are for restoration or building alterations.

"We have a particular concern for fire safety, fire alarms, re-wiring and communications, especially as we plan to extend the computer network into student rooms," Mr Lacey says. "We now have everything on disc, plus full-size drawings and smaller ones that are ideal for taking to meetings: it makes life so much easier."

"We're looking forward to using space as strategically in the next 20 years, and these drawings, so easy to update, are essential to making sure that we don't do ad-hoc alterations in the interim."

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2 JBA
Turnpike Gate House, Alcester Heath
Alcester, Warwickshire B49 5JG

Company Description:
Guidelines is a graphical client server application development tool that allows developers to design business applications that can run on multiple platforms. Guidelines generates code in C++ running on the threshold of object oriented programming, with reusability of code and the rapid rebuilding of applications being the main advantages, along with the ideal of real platform independent applications.

Hardware:
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Software:
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Applications:
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3 BANYAN SYSTEMS (UK)
Banyan House, Northwood Park
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Hardware:
286 or higher Intel or compatible IBM memory 5mb disk.

Software:
English, French, Spanish, German, Haugal, Canadian French.

Users:
Ten twenty one hundred

Prices:
Respectively ECU £1569 £7038

4 MOVEX (UK) LIMITED
Savile House, Savile Road,
Elland, York YO5 0NU
Tel: 01422 377611 Fax: 01422 310109

Company Description:
Integration, flexibility, ongoing and proven development path, real commitment to high quality international service and support are just some of the reasons why over 1100 major companies have chosen MOVEX software - often to support BPR and Reengineering. Over 80% of MOVEX's sales are to pan-European companies, producing a turnover of £74 million per annum.

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Software:
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Users:
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Applications:
Truly integrated manufacturing, financial and distribution software. Strategy includes OOT and Client Services.

5 PEOPLESOFT UK LTD
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Hardware:
IBM, Digital, Hewlett Packard, Data General, SUN, NCR.

Software:
Fortune 500 and Fortune 1000

Users:
PeopleSoft Financials, PeopleSoft HRMS, PeopleSoft Distribution.

6 DIAGRAM SYSTEMS LTD
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Company Description:
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Hardware:
CFT supports the majority of hardware platforms and networks.

Software:
Worldwide

Applications:
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7 MICROVITEC MULTIMEDIA
Bolling Road,
Bradford BD4 7TU
Tel: 01274 390011 Fax: 01274 734944

Company Description:
Typically used to facilitate transmission and storage of video material, Microvitec Multimedia's MPEG encoding suite can convert and compress material to ISO11172 MPEG1 and ISO 13818 MPEG2 data streams. Video source material can be supplied in a wide range of formats: analogue and digital between, D1, D3, D5 and one inch C.

Hardware:
Any MPEG standard decoder required for playback.

Software:
Worldwide

Applications:
Training video on demand, video games and TV, video CD and CDi

Users:
On application.

8 PLATINUM SOFTWARE UK LTD
85 London Wall, London EC2M 5ND
UNITED KINGDOM
Tel: 44 71 628 1250 Fax: 44 71 628 1255

Company Description:
Platinum is an industry leader in providing large-scale client/server financial systems to blue chip organisations around the world. Platinum financial applications can offer benefits such as: instant responses to requests for information, the flexibility to tailor the software to your business, a wide choice of reporting options, a full Windows Graphical User Interface and total integration with desktop applications.

Hardware & Costs:
486 Intel based processor. Entry level prices. FROM £20,000 TO £100,000

Software:
UK, Europe, United States, Australasia, Asia

Users:
Financial Accounting and Management Information Software.

9 FMI SYSTEMS LIMITED
Greenfield House, Simon Road,
East Grinstead, Sussex RH19 1UZ
Tel: 01323 326000 Fax: 01323 326060

Company Description:
HDE for Windows provides IT Management with a comprehensive high performance. Help Desk and Resource Management System that addresses today's requirements for knowledge-based Help Desk, extensive problem management and change management capabilities and a comprehensive management information sub-system.

Hardware:
HDE is a PC based software system. Prices start at £9,000.00

Software:
HDE is sold in UK, Europe and USA.

Users:
The management of Internal and External Help Desk environments.

10 CEDAR DATA PLC
Oriel House, 52 Coombe Road,
New Malden, Surrey, KT3 4QB
Tel: 0181 9497057 Fax: 0181 9498723

Company Description:
The office financial management system is a flexible, fully integrated management system able to provide up-to-date information across multiple users and sites. Cedar has been developed in ORACLE and comprises General, Purchase and Sales Ledgers; Fixed Assets; Time Recording; Purchase and Sales Order Processing; stock control and project and commitment accounting.

Hardware:
All major hardware manufacturers

Software:
UK and Europe

11 ADMIRAL TRAINING LIMITED
Rutherford Close,
Meadway Technology Park,
Stevenage, Hertfordshire SG1 2EF

Company Description:
Still confused about multimedia and the significant impact it can make on your business? Admiral can provide all the support and advice you need together with the skills to develop a full range of multimedia applications.

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Multi platform.

Software:
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12 MICROVITEC MULTIMEDIA
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Bradford BD4 7TU
Tel: 01274 390011 Fax: 01274 734944

Company Description:
Creator from Microvitec Multimedia is a new multimedia information publishing package. Requiring no programming skills and priced at £129.95, it allows any Windows PC user to develop their own interactive systems incorporating audio, text, graphics and moving images. Creator is supplied with a CD Rom which includes graphics, sample templates and sound files.

Hardware:
486/53 with min 4MB of ram. Local bus or PCI graphics card.

Software:
Worldwide

Users:
POS, POI, Training, education.

Prices:
£129.95

13 HARRIER SOFTNET LIMITED
Unit 1a, Falcon Business Park, Ivimey Road,
Fitchampstead, Berkshire RG11 4QG
Tel: 01734 731181 Fax: 01734 735496
E-mail: sales@harrier.com WWW: http://www.harrier.com

Company Description:
Harrier Software distribute open networking software products designed to provide interconnectivity between different computer systems such as DEC VAX & Alpha, PC DOS, Windows & NT, UNIX and Novell Netware. The integration products that we supply and support utilise industry standard protocols such as TCP/IP, NFS and IPX/SPX, (they include TOV's MultiNet, MultiWare, Phase-IP and SecureIP).

Hardware:
Harrier products link systems such as DEC VAX & Alpha, PC DOS, Windows & NT, UNIX and Novell Netware. Costs are available on request.

Software:
Harrier have offices in Berkshire and La Defense, Paris.

Users:
Products allow dissemination of information from one proprietary system to another.

14 ANIXTER (UK) LTD
Anixter (UK) Ltd,
Anixter House, Princes Road,
Colchester, Essex CO1 1DA
Tel: 01753 668884 Fax: 01753 817124

Company Description:
75% of today's IT problems occur within the network infrastructure upon which applications are run. Network management solutions from Anixter help customers monitor, predict and avoid major service loss; and provides a major tool in network repair. Anixter provides management solutions based upon products from Bay Networks, Digital & 3 COM.

Hardware:
Solutions that run on DOS & UNIX platforms

Users:
Network managers and technicians.

15 INFERENCE CORPORATION
31-37 Windsor Road,
Slough Berks SL1 2EL
Tel: 0753 811855 Fax: 0753 811860

Company Description:
Inference Corporation is the leading supplier of software tools and consultancy services supporting the automation of the Front Office-delivering competitive advantages through customer-focused applications including helpdesks and call centres. Inference's products and services are focused in three areas: Front Office, application development tools; Customer Service and Help Desk application shells using case-based reasoning; and strategic systems consultancy.

Hardware:
Inference software runs on networked PCs supporting Windows, OS/2 on UNIX.

Software:
Worldwide

Users:
Inference technology and services has provided solutions for Compaq, Argos, London Electricity, IBM, American Airlines, Ford, Swiss Bank Corporation and J Sainsbury.

16 ADMIRAL TRAINING CENTRES
Ivory House,
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17 AVCO FINANCIAL CORP
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Hardware:
IBM or compatible 486, with 8mb RAM, 10mb HardDrive space, VGA graphics, mouse, DOS & Windows.

Users:
500 Worldwide

Prices:
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18 FAXBACK LIMITED
Fairfield House, 24 High Street,
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20 SOFTA & CO LTD
11 London Road, St Albans,
Herts. AL1 1LA
Tel: 01727 863234 Fax: 01727 844154

Company Description:
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Hardware:
PC Architecture, Microsoft Windows, Windows NT, Client Server Databases.

Software:
UK & Europe

Users:
Software components for all key sales & marketing processes.

21 INTERNATIONAL DATA SECURITY
10 Alfred Place,
London WC1E 7EB
Tel: 0171 631 0548 Fax: 0171 580 1466

Company Description:
IDS specialise in PC and network security and management. We provide solutions to enable you to comply with legal requirements and to prevent computer misuse. These include access control, auditing of hardware and software, virus scanning, software and hardware metering and software distribution.

Hardware:
Global

Users:
Novell, DOS, Windows, OS/2

Project management with IT

A mix and match approach

A plethora of packages is available to the project manager, but satisfaction is not guaranteed

Managing most projects calls for a mix of skills, resources and disciplines. Yet project management, as a sub-stratum of data management, tends to be pushed into a corner, writes Claire Gooding.

In many companies, the schedule kept inside someone's head, or a wall-chart, with moveable strips and added scribbles, is deemed an adequate planning tool - no need for fancy computerised Gantt charts.

Yet a wealth of software packages exists, from Microsoft's Project Manager and the Project Management Software Centre's 199 Project Commander, to the long-established names such as Cascade from Mantix Systems, Artemis from Lucas Management Systems (currently in acquisition negotiations with EDS) and Welcom Software Technology's Open Plan.

The 1995 report* on project management from Cambridge Market Intelligence lists 25 suppliers and dozens more packages. Most are used internationally, and many companies take a "mix and match" approach, selecting packages for their individual strengths. IT specialists themselves have failed to get to grips with project management techniques, despite the fact that bespoke tools such as PMW, now sold by London-based ABTL, have been around for years.

The new generation of project management tools - such

as CADCentre's PDMS and Asta's PowerProject - tends to be more flexible than its predecessors. There are also sundry specialist tools such as the Predict software from the Oxford-based Risk Decisions, which tests the risk element in models and schedules, and makes "what if" assessments of liabilities.

Despite this, Mr Mike Evans, director of Cambashi, the process industry analysts, says that satisfaction with project management packages is "fairly low". This, perhaps, reflects the increased importance companies attach to the discipline: packages that do not perform cannot be tolerated.

Mr Evans continues: "Project management is seen as a sub-stratum of data management, which is the entry-point for many businesses. Controlling the process is as important as controlling the data management. This is big business, as is demonstrated by Computervision's deal with Rolls Royce for total product data management (TPDM). It's indicative of how people have woken up to its importance."

Mr Ken Lane, editor of Project Manager Today, points to the failure-rate of IT projects - "there have been a lot of unsuccessful projects, some publicised, some secret," he says.

His magazine plans to air the problems this September in a two-day conference on the subject of good management through IT, jointly sponsored by the British Computer Society and ABTL.

*Management Report 1995, by Cambridge Market Intelligence. Tel: +44 (0)177 924 7177. Project Manager Today, tel: 01734 761 3391.

Integrated project design

It pays to plan in fine detail

Software for design and management gives a leading building company clear cost advantages

Integrated systems are seen as essential for Westbury Homes, one of the top ten estates developers in the UK, writes Claire Gooding.

"Essentially, when we're talking about project management, we mean managing the entire business," says Neil Allen, director of IT at Westbury Homes. With headquarters in Cheltenham, the company builds housing estates in many parts of the south of England and South Wales.

"Our systems touch virtually all areas of our business and we use them as controls. Just as the businesses are integrated, so the information should be, too," adds Mr Allen.

Westbury runs a network of eight HP9000/G30s, and 40 workstations for Computer Aided Design (Cad) work. These are distributed around the head office in Cheltenham, with wide area network (Wan) links to regional offices in Northampton, Kidderminster, Cardiff, Gloucester and Bristol. There are around 130 networked PCs across the group, and a few dumb terminals.

For its Cad work, Westbury uses the specialist Gable architectural package. Originally developed at Sheffield University, this uses terminology and methodology appropriate to architecture. Ground engineering staff uses the industry de facto standard Moss 3D package - often used in highway design - from the company of the same name.

Not averse to adopting standard packages where appropriate, Westbury decided that it was important for in-house systems to be fully integrated, to the degree that it should develop them itself, using a fourth generation language for speed and ease of maintenance - "on our PCs we have standardised on SmartSuite and WordPerfect, but all our core systems were in-house developed, using Cognos PowerHouse, and its interrogation tools Impromptu and PowerPlay," explains Mr Allen.

This all-embracing core,

known in-house as Omnis, underpins all the applications, and represents a software investment of £3m. It is this effort that has ensured that Westbury has integrated systems from design through to production.

"We've developed our own methodology for using Cad. That might sound grand, but in practice we have set certain ground rules, for example, everything is in 3D," says Mr Allen. "As a result, we've been able to develop software that links our Cad systems with the commercial systems: operational systems such as land-buying, production planning, estimating and costing."

"We look at each project separately, with systems written in-house around planning and estimating activities to provide the project management information. We occasionally 'drop into' Microsoft Project, but find we need more detail than it can supply."

Each estate is planned down to fine detail, so that a breakdown of components - right down to the number of joist bolts or gallons of paint - provides an accurate costing, and tight controls during construction. Omnis can also use this data to calculate whether a new site is worth development, based on local house-prices. Mr Allen believes the software has given Westbury a real advantage in a depressed housing market where cost-control is vital.

Westbury is not alone in the construction industry in finding that few packages give it the bird's eye view that it needs, balancing financial information with operational data.

"We are mindful of the fact that house-building is a very capital-intensive business: completed, unsold houses are expensive to hold in stock. The levels of work in progress versus sales rates are what concern us, and the normal project planning packages just don't reflect that."

"We find that our in-house systems are much more applicable to the way we control the business," concludes Mr Allen.

More reports on project management and Cad will appear in the September issue of the FT-IT Review.

Project control - an application in the construction industry - report by Claire Gooding

Planners take a pragmatic view

How Laing, the UK construction group, integrates operations and data across seven divisions

Many car drivers in the UK want to see the M25 motorway widening at Reigate completed on time. The same goes for the Second Severn Crossing and the construction of Ashford International Station.

Laing, the construction group, responsible for all these projects, has its pick of software tools for project management. It works on a vast range of jobs and its policy is to allow a wide selection of tools. Compatibility, of course, is essential.

"One of the rules is that all software products have to run under the Unix operating system, and all network products have to work under Novell's Netware 4 - they're de facto industry standards, so that is not much of a constraint," explains Mr David R Jones, IT director.

Laing's seven operating divisions have agreed to limit the choice of any software package to four potential suppliers per application area. This helps ensure that training, maintenance and internal knowledge remain manageable.

"Our role is to co-ordinate: if there's a majority opinion, a new 'best of breed' might

replace a current one," he says. "It works well, as a flexible discipline, when people wish to try out something new. Users quite rightly only want the productivity, while we have to be aware of support costs."

In the area of project control, it is vital that products interface with one another, but, according to Mr Jones, total integration is not essential. "Files have to be passed between the package and, for example, procurement software, because we have to know when an item of supply is going to be late - it may affect contract work. Within an integrated system, the update has to be real-time, instantaneous: we're saying that, effectively, a twice-a-day update allows us enough flexibility."

Only three project management packages are currently in use at Laing: Power Scheduler from Advanced Management Solutions, Hornet from Claremont, and Openplan from the company of the same name.

"Certain planners have decided preferences, based on experience or the type of project involved, but all three cover the same ground," says Mr Jones. "The end-users must have the power to choose the



David Jones: watching the costs

software that is right for them, but ideally we'd like our planners to be familiar with all three planning systems."

Mr Ted Kelly, divisional planning manager of Laing's civil engineering division, is using Schedule Publisher for project control on the Severn Crossing. The choice came about initially through a word-of-mouth recommendation.

"We had been running other planning tools - Claremont Control's Hornet and Asta's PowerProject, and Primavera, the principal planning package

internationally. In the course of tendering for work for Scottish Nuclear, we found that it specified Artemis 7000 for project management, but we were unwilling to spend a great deal to comply with this. The managers on the Scottish Nuclear project suggested that Schedule Publisher, with its facility to write to Artemis, would be an alternative," Mr Kelly explains. "Since then the package has won a following, and is now used in Laing Civil Engineering, Laing Management, John Laing International and also our industrial engineering branch."

The Second Severn Crossing, currently one of the largest construction projects in the UK, is sub-contracted to the joint venture between Laing and the French construction company, GTM. The four-year project, worth in excess of £300m, took two years to prepare, including the design work and getting the necessary bill through parliament. Construction started in 1992, and is due to finish in April 1996.

Like many other construction companies, Laing is looking hard at the need to integrate operations and data.

"Integration is something that certainly needs to be done between design and project management. There should be no barriers to this, but it rarely happens, and a conscious effort has to be made," says Mr Kelly.

The company is becoming proficient in a project management system called Jobmaster, which allows total integration. It is currently used for estimating, but can help control projects from conception to completion. The system, from Construction Computing of Matlock, can deal with scanned images, documents, procurement, estimating, scheduling, and quantity surveying. "After 18 months of experimenting, we are preparing to take it out on-site as a project management tool," says Mr Kelly.

Detailed project planning, however, is done in Schedule Publisher, which provides several levels of detail.

"On level one we have the overall project schedule, done at the outset and updated once or twice in its course," explains Mr Kelly. "Level two is short term look-ahead - between three and six months - and is updated every few months. The two-weekly

rolling schedule produces detailed two-week planning."

"We discovered its potential on a small road re-construction job on the A40 in Wales. It was used for the production of 'as built' records of the project - to do comparisons of what we did and what we thought we were going to do. It is very useful to measure changes, and give a clear concise view of what has taken place, because you can superimpose more than one schedule on one piece of paper and see where the differences are. It also keeps a record of each activity and keeps track of plans and variances, along with what actually went on: a useful facility we never had before."

A dozen or so people - mainly planning engineers who move from project to project and have portable computers - use the package.

"It's very simple to export test files into 1-2-3 or Excel if you want to produce smart graphs and presentations," he says. "But the real potential is the analysis of sub-contractors' performance, which we're trying out at the Ashford project: this is a big area for the future. The idea is to produce a value analysis per project."

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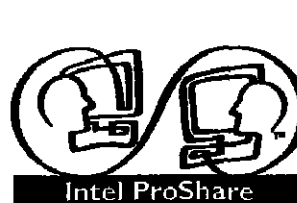
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14 IT news

IT
UPDATEHand-held
computers give
greater accuracy
in collecting
economic data

Hand-held computers have replaced clipboards and pens as the collection method for the Retail Price Index, the UK's monthly measure of shop prices. This crucial economic data is now collected by 400 researchers armed with Psion Series 3a computers programmed for RPI data. The switch to IT came as the RPI market research was contracted out from central government to a private contractor, Research International.

David Cahn, vice chairman

of Research International, explains that the Psion equipment has eliminated a previous margin of error. Information collected under pressure and recorded by pen and paper inevitably contained some false figures.

"We are driving out mistakes at the collection point. These systems contain the figures for the last month's shop prices and are programmed to check for acceptable ranges in the data," he says.

So a slip of the finger on the keyboard will register with the software as a suspect price hike. Data collected in the field is fed back to Research International by modem.

Psion developed the RPI application and sold £400,000 worth of Series 3a machines, accessories and support to Research International. The Series 3a retails at £99 and runs off conventional batteries. These give an effective life of around 50 hours before replacement, ten times the endurance of most portable computers.

- Michael Dempsey

Music by fax

Information technology is making a long way to go to dominate the personal computer market in Russia and Central Europe. The IT research group, Dataquest, reports that less

than 25 per cent of PCs shipped there in 1993 came from Western vendors. IBM had only 5.6 per cent of the Russian market, well behind the local vendor Land with 19.3 per cent.

During 1994, Land suffered from quality problems, but another Russian company, IVK, rose in prominence. Poland's Optimus claims 35 per cent of its local PC market share.

Dataquest analyst Natalie Spitz says western companies are still deterred by political instability in the region, but points out that the export market there offers "huge opportunities."

Of 40m PCs shipped worldwide in 1993, only 1 per cent went to Russia. A parallel Dataquest survey reveals a burgeoning market for cellular communications in eastern Europe, with sales of 65,000 cellular phones in 1993 due rise rapidly to 2.25m by 1998.

- Michael Dempsey

Western computer
suppliers lag behind
in Russia

Western computer suppliers have a long way to go to dominate the personal computer market in Russia and Central Europe. The IT research group, Dataquest, reports that less

Extending the
boundaries of
knowledge

Desktop videoconferencing is proving a boon at the University of Ulster in Northern Ireland. The system is being used to extend business enterprises throughout the province, and for remote lectures



Text and technical drawings can be transmitted with BT's VC7000 desktop videoconferencing units - see report, this page

Electronic wallets

An imagined world
of 'digital cash'

Mobile computing requires miniaturisation and there is a natural physical limit to how small a computer can be made. After all, a keyboard must be large enough to be comfortable and a screen cannot get too small without becoming unreadable.

But if users dispense with the keyboard, and if they do not need a large display area, mobile computers could one day become electronic wallets. They could store "digital cash," display pictures of family members, carry digital business cards - all the things that people have in their regular wallets, writes Tom Foremski.

These wallet PCs might seem fanciful and even slightly ridiculous, but they are a goal of US and European researchers and they could become a realistic option by the end of this decade.

One of the most vocal supporters of the wallet PC idea is Microsoft chairman Bill Gates. At the Comdex/Fall computer show last year, he introduced a film depicting Microsoft's view of the future, specifically how people will be using new technologies in Microsoft's home town of Seattle, ten years from now.

The most striking aspect of this imagined world was that there was no cash, at least not in the familiar physical sense. Purchases were made using small, wallet PCs that used wireless infra-red links to make and receive payments. Paying for a cup of coffee from a street vendor was as simple as pointing the wallet PC as if

it were a remote control for a television set and pushing a button. A mother was shown giving her son his weekly pocket money by making a wireless transfer from her wallet PC to his.

With Gates a keen advocate for wallet PCs and with Microsoft's enormous influence on the IT industry, a technology direction has been set that is certain to attract other companies. After all, there is a potential market of hundreds of millions of customers in the US alone, not to mention the billions of people worldwide yearning for their own electronic wallets.

Microsoft is not alone in exploring the idea for wallet PCs. The European Union's Esprit research program has a project called Cafe (Conditional Access for Europe) which is working on design and security issues related to creating an electronic wallet. The Cafe wallet will also use infrared technology for wireless payments and prototypes are being prepared for trials later this year.

To prevent others from stealing digital cash transactions, Cafe is using public key cryptography technology which makes each payment specific to the recipient. The results of several other Esprit research projects will eventually be included in the Cafe project. These include Cascade (Chip Architecture for Smart Card) to your home. The same could happen with watching TV - the capability to instantly buy anything you hear or see.

Plans to preserve
historic documents

A plan to automate the Pontifical Libraries and help preserve its rare book collections is under way, following a strategic alliance between the Xerox Corporation and Ernst & Young, to assist the Gregorian University in Rome.

Following meetings in New York and Rome, a team of experts is exploring the use of document image technology which will not only preserve rare collections but make them available to scholars worldwide. Using Xerox "documents on demand" equipment, it would be possible to rescue rare books from the decay of age and reprint them at any time or location. It would also allow on-line access to books from around the world, via the Internet.

- Michael Wiltshire

Top PC seller
in China

For the second consecutive year, computer market analysts at Dataquest have named AST, the computer company, the top personal computer vendor in China. Among foreign and domestic PC suppliers in China, AST has 21.4 per cent of the market.

To localise its products, AST has worked with the leading Chinese software developer, SunTendy, to bundle its utility program, "Chinese Star," with AST systems to provide enhanced Chinese language capabilities on PCs.

AST entered the Chinese market in 1988 and now has a sales network of 10 main distributors and 150 PC dealers supporting 2,000 resellers across China.

- Michael Wiltshire

A journey into
the future

A new study foresees three-dimensional video-phones, machines that recognise body language and gestures, and electronic mail that talks to you over a mobile telephone - all within the next 25 years.

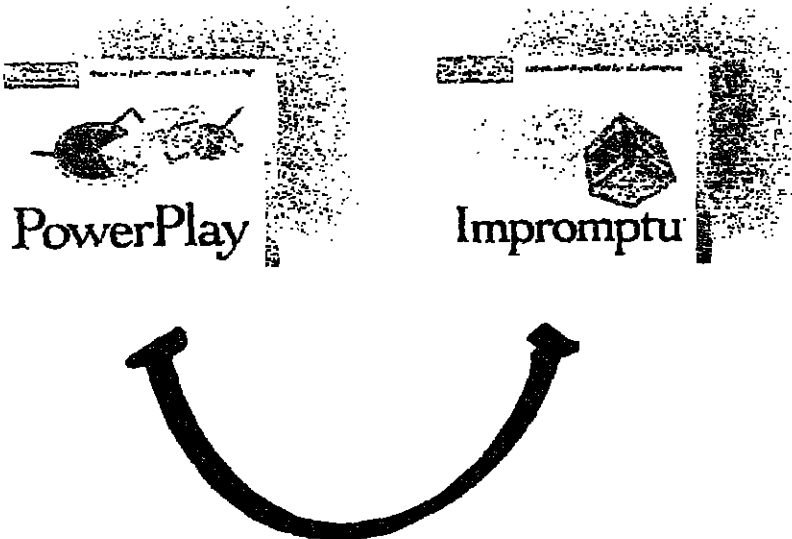
A key element in making these developments possible will be an increase in computer power, which could be a million times greater than today's levels, if the pace of development in the last 25 years is maintained, says the study.

These predictions are part of a comprehensive futurology research project, led by Professor Peter Cochrane, head of BT Laboratories' Advanced Application Division at Martlesham.

Using a combination of projection, extrapolation and informed "guesswork", the team has compiled 200 predictions of technology and society. Prof Cochrane comments: "We have to thank the 'space race' and the cold war for promoting the birth of integrated circuit technology. For example, there are now wrist watches that yield more computing ability than some 1970s mainframe computers. Ordinary cars today have more 'intelligence' than the original lunar lander."

Among the team's predictions is videoconferencing systems that will create the impression of 'virtual presence', being three-dimensional and life-sized - "we will probably have also discovered a new mechanism for communication, other than radio, electronic and optical transmission."

- Michael Wiltshire



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■ **Multimedia** - applications such as home shopping and TV-related services are likely to be boosting the European consumer market

IT directions

Multimedia technology brings together television, video, sound, animation, still images and text on a personal computer or workstation.

As the multimedia market grows, it will begin to merge with telecommunications on one side and television on the other.

Here, and on the following four pages, FT correspondents examine the latest advances in the technology and its potential markets. Case studies of new business applications appear on pages 16 and 17.

■ New multimedia standards

Big benefits for all

Unlike earlier technologies, standards in multimedia are evolving fast to the advantage of the industry and its customers, writes Martin Banks

Standards are as important to the success of multimedia as they are to any other technology development. The broad range of multimedia technology needs many different standards - from network communications and storage to video and audio data compression.

At the communications level, the demand is for 'bandwidth'. The greater the bandwidth, the faster data can be transmitted. This is particularly important for video and audio data which must not be interrupted during transmission over a network.

Integrated Services Digital Networking (ISDN) communications is emerging as a leading standard for multimedia.

"ISDN is now the entry level for video and audio data," says Mr Richard Johnson, managing director of Signpost which operates the Multimedia Business Library.

"Most large organisations have ISDN to their switchboards now and once its up and running, it's so cheap. You can, for example, use a remote video server at the same speed as a hard disk," he goes on.

The main advantage of ISDN is its ability to use up to 30 channels as a single communications link. If only small amounts of data are transmitted, a single channel can be used. But if more bandwidth is needed - such as in video transmission - more channels can be dedicated temporarily to the task.

Asynchronous Transfer Mode (ATM) communications is another key standard which promises to increase bandwidth across the board. In addition to speeding up communications in networks, it will, in the long term, speed up local area network (LAN) traffic and bring higher bandwidth to the desktop - see report on page six of this Review.

Unfortunately, ATM communications require new adapter cards in desktop computers - which makes the technology prohibitively expensive in the short term.

"ATM is a great technology - but you have to change a lot of things and this will slow down its acceptance," comments Mr Philippe Braverman, president of Cisco Europe, which specialises in multimedia networking.

He sees the short-term solution in using a combination of ISDN and improvements to current LAN technology.

"Europe is fortunate with ISDN which is adequate for most current applications. If you use this with improved Ethernet LANs which can give you more bandwidth to the desktop, you can meet most needs," he adds.

Data compression standards are another key area. They cut down the amount of data which has to be transmitted over the network and reduce storage requirements.

The two main compression technologies on the PC currently are Microsoft's Video 1 and Intel's Indeo - both of which are offered in Video for

Windows. On the Macintosh Quicktime system, the main technology is Cinepak developed by Radius.

These are proprietary standards and, therefore, limited compared to emerging standards from the US organisations, the Joint Photographic Experts Group (JPEG) and the Motion Picture Experts Group (MPEG).

The original JPEG standard was devised for compression of still pictures. But it has been enhanced for video under a new name - Motion JPEG or M-JPEG. This should not be confused with the emerging MPEG standard which is specifically devised for video.

The first MPEG compatible products have begun to appear. Both Truevision and Miro - two leaders at the top end of the graphics adapter market - launched MPEG products at the CeBIT exhibition last March. Other products will follow - taking the MPEG standard to a wider audience.

Another key standard for video has emerged from the Video Electronic Standards Association (Vesa). Called the Vesa Media Channel (VMC), this standard aims to reduce the burden on desktop computers when it comes to processing video signals.

The various components inside a desktop PC - the processor, the storage, peripheral devices, and so on - are linked by what is called a system 'bus'. All data moving from the computer's processor to memory and the screen is carried on the bus. Data-intensive tasks such as video processing place an enormous load on the bus.

The VMC acts as a bypass and carries video directly to the screen - "the PC bus is a bit like the M25 motorway - it doesn't matter how many lanes you build - it still clogs up at rush hour. The VMC is like a flyover and allows you to take multiple video streams straight to the screen," says Mr Neil Davison, European marketing manager for Videologic, the multimedia specialist.

"The nice thing about VMC is that it works with the existing bus architectures on the PC - which is very important for the installed base," he adds. VMC's ability to carry multiple video streams is especially important in areas such as financial services, he says - "they want to be able to carry things like Reuters and CNN as multiple live video windows on their desktops."

VMC looks set to become an important mainstream multimedia standard, according to Mr Davison - "Compaq has built it into its new range of PCs, which is very important for its acceptance. Other manufacturers are bound to follow their lead," he says.

The standards infrastructure for multimedia is evolving fast and - unlike many earlier technologies there appears to be a consensus. This will bring benefits both to the industry and to its customers.

Home consumer market is leading the way

By the end of the decade, multimedia facilities are likely to be as common as full colour graphics on today's personal computers, writes Philip Manchester

PCs," says Mr Barry Thurston, managing director of Scala UK.

A specialist in computer-based television systems, he adds that the consumer market in the US is being helped by the existing satellite and cable television infrastructure - "cable is lagging behind satellite by about six months in the US," he says. "It's going to take longer in Europe because of the different infrastructure. But I think we will see something happening by 1997."

Mr Thurston sees applications like home shopping and television-related services boosting the acceptance in the consumer market. Other manufacturers agree: "There is certainly a lot more acceptance of multimedia across the board. But the consumer market is looking very good," comments Mr Kanwal Sharma, new media marketing manager at Apple UK.

"Parents are buying it for their kids as an educational tool - but also for games and

entertainment," he adds.

Mr Toon Bouten, European director of Compaq's consumer group also sees fast growth in the home market: "Europe is slower than the US because of language and cultural differences. But in the key markets - UK, France and Germany - we are seeing 20 to 30 per cent annual growth."

He sees the home market split into three sectors: 50 per cent for home business applications, 30 per cent for education and 20 per cent for entertainment - "the growth in each country will depend on the availability of local products on CD-ROM. But also the availability of networked services, such as European On Line, will help to push it. I think there are many small pushes which will add up to a big push to multimedia," he says.

While the consumer market will lead the way, there are signs that corporate use of multimedia will follow quickly. Mr Sharma of Apple likens it

to the desktop publishing market a decade ago when pioneers saw the potential of a new technology - "companies are starting to use it in pilot projects for things like point-of-sale and point-of-information applications. But they are also using it for presentations to put across sales messages," he says. "This will create whole new industries geared to building the content for multimedia applications. A year ago they were talking about it - now they are doing it."

Mr Neil Davison, European marketing manager at Videologic divides the potential business market for multimedia technology into five areas: training, point-of-information kiosks, videoconferencing, business TV and presentations.

"An established market like computer-based training is an ideal starting point for many companies," he explains. "Multimedia technology adds a new dimension to training for many companies. They can package

up training courses for individuals which can be downloaded from a central server to provide just-in-time training for new products."

This, he adds, will enable companies to cut training costs by providing quality instructions for staff without sending them away on expensive residential courses - "training can be delivered to the desktop when it is needed at much lower cost."

Multimedia presentation is also an attractive area for business, according to Mr Davison: "Companies are already distributing annual reports on CD-ROM. They can put a video of an interview with the chairman, show off new manufacturing facilities and so on."

He sees the five main areas of the market developing at different rates, however - "it's not an homogeneous market because different companies want different things. We see,



Technical trials for a new interactive multimedia service: British Telecom is researching ways to bring together the telephone and the television set to enable customers at home to choose and order entertainment and information services from a 'menu' on an ordinary television set.

for example, a big demand for training in financial services companies. They are also interested in point-of-information kiosks."

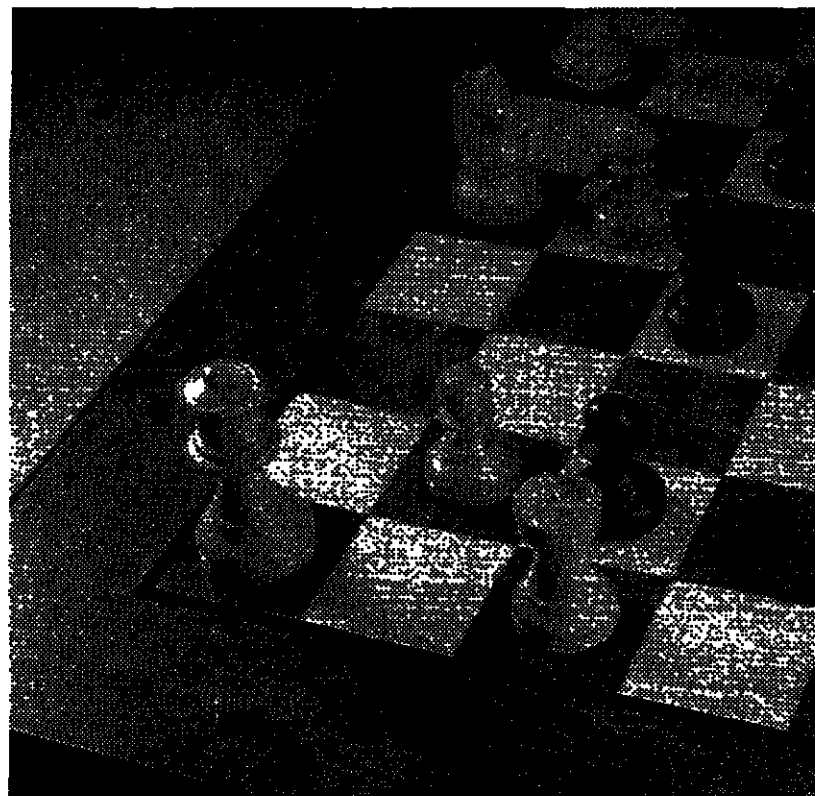
He also sees manufacturers such as the Rover Group using the multimedia technology at the point-of-sale for innovations in marketing. The key to corporate use of multimedia is its inclusion in the broader corporate information technology strategy, according to Mr Davison.

"There is growing evidence that information systems departments are starting to take notice. They are specifying corporate PC purchases in a way that makes them 'multimedia-ready'. Multimedia needs to be looked at in terms of competitive advantage and

greater efficiency." But multimedia technology is still either crude or expensive: full screen, full motion video, for example, is not viable on anything less than a high specification PC with a lot of memory and large storage resources.

Typically, a ten-second video sequence consumes about 60 megabytes of hard disk storage and needs a fast processor such as a Pentium or a PowerPC to replay it at a reasonable size. Yet there are signs that multimedia is reaching a level of maturity which will make it attractive both to the home consumer and business. By the end of the decade, it is likely to be as common as full colour graphics on a PC is now.

Several Moves Ahead



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16 IT multimedia

CASE STUDY Rover dealers' multimedia system

New way to sell cars

Customers select vehicles via multimedia kiosks

The increasingly competitive motor car industry is always looking for new ways to sell its products. It is no surprise, therefore, that manufacturers should turn to advanced technology as a means to gain an edge over their competitors, writes Philip Manchester.

Multimedia point-of-sale kiosks are an obvious choice. The glamorous nature of the product lends itself to multimedia presentations and interactive features can let prospective purchasers 'configure' their own model.

The Rover Group claims to have the most advanced system of this type. Under the name Discus, the system is being rolled out to the manufacturer's 500-strong UK dealer network this year and there are plans to extend it across Europe in 1996.

What makes Discus different to most multimedia 'kiosk' applications is its connection to other information technology systems. Not only does it link through to Rover's manufacturing systems - so orders can be processed quickly - it also links into the dealer's own systems.

"As far as I am aware Rover is the only manufacturer that is integrating with the dealer's own systems," says Mr David Stubbs, Rover's product manager for Discus. Discus sits on a Windows PC in the dealer showroom. It displays car model specifications together with



The multimedia dealer system includes full-motion video and still images, allowing customers to 'create' vehicles on screen

video sequences of the car in a variety of situations. The multimedia system based on Videologic's graphics adapter cards is used to display high-quality video on the PC's screen to illustrate model options such as automatic braking systems and airbags - "modern cars are so complex that customers can easily be overwhelmed with facts. You could give them telephone directory and tell them to study the options. But with Discus they don't have to drink from a fire hose - they can sip from a glass," says Mr Stubbs.

"It also helps the sales staff. It is so hard to keep up with the changes. This system makes sure they give the right answers to customers," he adds. The Discus systems also includes the possible financial options available to purchasers.

But the real advantage of

the system is how it changes the manufacturing process. The PC is linked directly to the Rover factory so it can access the most up-to-date information on the current models. And it can accept an order and give the customer a delivery date for their new car. There are long-term plans to take this further - "by mid-1996, we aim to make the system completely on-line and tie right through to our suppliers. Not only will this save us money by reducing inventory, it means we can make continuous improvements and keep track of them," says Mr Stubbs. He sees Discus "changing the whole way that cars are sold in the future - we've built something which we hope reflects the way people do business and the way that business is done. It will either change our understanding of the market or change the market itself".

On-line multimedia

Marriage of two technologies

A new service is created with a combination of networking and multimedia

Innovations in technology have always spawned new industries and taken new companies from start-up to corporate respectability at lightning speed. Multimedia technology is no exception and the first of what will be many innovative companies are now starting to come to the market, writes Philip Manchester.

The Multimedia Library, based in London, is a good example of the type of company to be created by the new technology. It brings together two technologies - networking and multimedia - to create a new service for industry: on-line multimedia.

"I was working in the conference business - putting together large-scale presentations for big corporates. It was hard to find good-quality presentation material for video and graphics - and it took a long time to get delivery," explains Mr Richard Johnson, managing director of the Multimedia Library.

We thought that we might find a company that was able to deliver multimedia content over the network - but were disappointed when we couldn't find one. We trawled through the networks - but nothing. My colleagues and I saw an opportunity to provide a service," says Mr Johnson.

It helped that he was working on a contract for British Telecommunications to pro-

vide its Integrated Services Digital Network (ISDN).

Graphic designers and video producers obviously need the highest quality material for presentations and ISDN has the speed and capacity to deliver it. Mr Johnson and his colleagues saw the connection and set up the Signpost service to provide a range of multimedia 'clips' over the network.

"There are lots of companies offering multimedia clips on CD-Rom - but as far as we are aware no one else in the world is doing quite what we are doing," he says.

The Signpost service offers designers and producers access to a broad range of multimedia clips - from high-resolution 'stock photography' to audio and video clips.

The Signpost service, launched in February, is available over a range of ISDN services including the Internet ISDN - an important factor, he adds, because right from the start Mr Johnson saw the need to provide a 'global' service. It can be accessed from Windows PCs, Apple Macintosh and Unix-based computers. Charges are based on usage.

"We think it will change the way businesses use multimedia and we have worked hard to make sure that it is accessible. We think it is important to cut through the technological jargon so often pushed by equipment manufacturers," he says.

The Multimedia Library points the way forward to a new range of services which are made possible by combining multimedia and advanced communications. It is the first of many.



Satellite-based multimedia network

Siemens Nixdorf, the computer company, has joined forces with Aphaserv to offer retailers what is claimed to be the world's first satellite-based

multimedia sales information network. ViewPoint, pictured above, enables retailers to broadcast sound and video images from a central

location, via satellite, to standard television sets in each of their branch stores simultaneously - for the cost of a single transmission

CASE STUDY New venture by Daewoo

Sales-room multimedia system helps to win over sceptical customers

In a report submitted to a G7 nations' summit on the information society earlier this year, consultants Coopers & Lybrand claimed that the rise of multimedia technology was being hampered by confusion and a lack of awareness. Coopers & Lybrand reached this conclusion after polling business leaders in 383 companies across France, Germany, the Netherlands and the UK, writes Michael Dempsey.

According to the report's authors, the EU should encourage co-operation and discussion between leading organisations in order to foster a general migration to applications and services that combine text, video and sound delivered through one interactive channel.

Many of the survey's participants reflected a common belief that the US and Japan will inevitably leave European businesses behind in the rush to apply multimedia systems to retail and financial services.

James Roper, director of the Interactive Media in Retail Group, thinks that one of the more effective examples of multimedia in action is being deployed by an Asian concern. But South Korean conglomerate Daewoo is using a British package to win over sceptical customers in the hard-selling world of

the car industry. Daewoo embraced multimedia after studying the basis of sales resistance among its prospective customers. People are reluctant to venture into a car sales-room because they may face instant pressure from unyielding sales staff. Multimedia technology offered Daewoo a way out of this traditional conflict, says Mr Roper - "they took on the challenge of directly empowering the consumer".

The project began in October 1994 and faced extraordinary deadlines. Daewoo began operating its £1.5m multimedia system in April.

Customer's choice

The prospective car-buyer enters a showroom and sits in front of a powerful PC with a touch-screen. A separate 'slave screen' merely reflects the activity on the PC, but this duplication makes it physically comfortable for several people to observe the system.

Daewoo knows that the family unit carries a lot of influence in choosing a car. The touch-screen menu leads the user through Daewoo's full product range, allowing the potential buyer to select colours and specify equipment options before seeing this model up on the

screen. Pricing structures are written into the software to run alongside car variants, so as more accessories are added the price display alters. Financing arrangements and insurance options can be called up and the user can print off the results of his interactive browsing. The audio facility allows a constant narration of the proceedings.

Software development cost £300,000, but this system would never have been delivered on time without the framework of Interactive Shopper, an ICL multimedia development tool, to capture information and aid Daewoo's consultants.

One to One Interactive Media and Julia Schofield Consultants put the package together.

Car showrooms feature between four and eight multimedia units costing a total of £5,000 each. But this is a price worth paying, says Daewoo business analyst Robert Steele.

"We see it as an integral part of the sales process. It fits in with our 'no haggle, no hassle' philosophy," he says.

All nine Daewoo showrooms in the UK, plus 136 outlets of motor parts retailer Halfords, now offer an alternative to aggressive car salesmen. Daewoo claims that public reception has been "very positive".

Video-conferencing - report by Geoffrey Wheelwright

A breakthrough in image quality

Manufacturers are unveiling a new range of high-end systems

Video conferencing systems have been around for a decade or more, but have traditionally been expensive, difficult to use and offered limited benefits. While they have often been an alternative to travel for some well-heeled multinational companies, video conference systems have not achieved much in the way of widespread use.

All that, however, is now changing with the advent of new videoconferencing and videophone systems based around PC technology. Traditionally, such systems have suffered from two significant problems - image quality and speed.

Until a few years ago, prototype videophone and some low-end video conferencing systems could either show images at either end as flickering, halting, black and white affairs or as even more halting colour images. Voices also tended not to synchronise with the images of the people who were speaking.

The image-quality problem had a lot to do with the lack of high-definition small screens that could be fitted inside personal videophones - the screens used for video-conferencing were often only marginally better.

The biggest culprit in the whole sorry story was the speed of transmission. If that could be fixed, all the other problems would melt away, observers felt. Most of the low-end systems produced in recent years - and particularly

those that operated over telephone lines - have only been able to show between 10 and 20 image frames per second. It is generally accepted that in order to achieve the best smooth, 'full motion' video, something like 30 frames per second is required.

Sending 30 frames of complex video information down the telephone line every second is no easy feat - and one which gets even harder when you start adding in the more detailed information needed to process colour images.

The telecommunications industry thought it had beaten part of the problem a few years ago by moving to install premium-cost 'integrated service digital networks' (ISDN) - so that the information, sent out over a phone line, would be digital, just like data handled by computers and compact disc players.

When information is stored in digital format, it can be more easily manipulated by systems that incorporate computer processing power. Although these have been helpful, they are by no means installed universally and are not the only key to the solution. And this is where the personal computer comes in. To achieve the kind of performance and quality necessary to make digital video-conferencing technology an affordable reality, users need a good deal of computer processing power to 'shuffle bits around' on the screen.

Users also need high-quality colour displays and data compression/decompression software. The usefulness of the former is obvious, while the latter is required to 'squeeze down' the amount of information

needed to be sent over the phone line and then expand it again when it has been received the other end.

PCs have been doing all these things quite successfully in recent years. Processing power is now approaching that of the mini and mainframe computer world. High-quality, digital colour displays are in common use in many personal computers and some form of compression/decompression software is an everyday part of many PC users' software utility libraries.

There is also heavy incentive for big suppliers in the PC market - such as Intel and Microsoft - to promote the use of video conferencing.

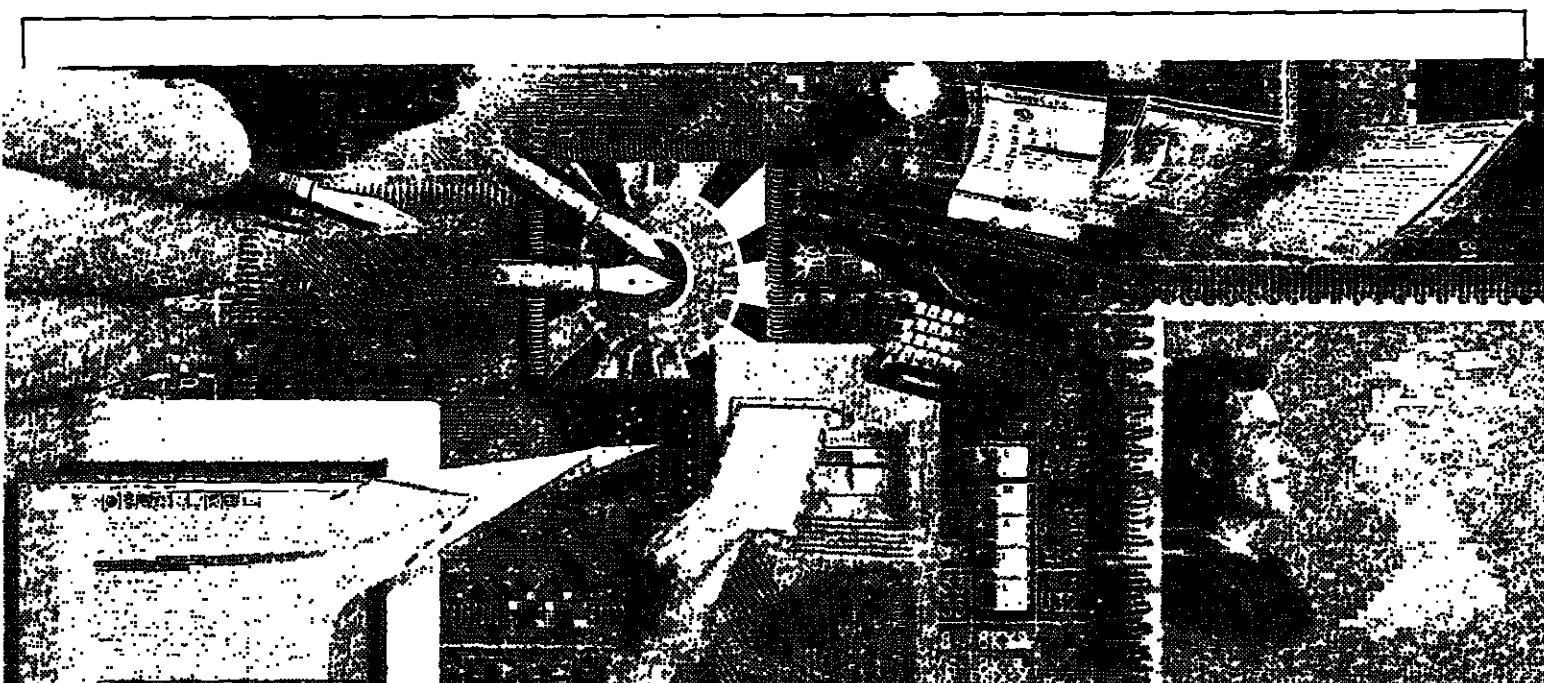
For Intel, widespread demand for videoconferencing will further drive demand for the high-end processors used to achieve maximum performance in videoconferencing systems - while Microsoft will benefit from sales of operating systems that provide software support for videoconferencing applications.

Intel is being very aggressive in seeking agreements with partners who can help foster the creation of a video conference-friendly business environment.

In the US, for example, Intel announced late last year deals with the New York telephone company, NYNEX, as well as the giant GTE's telephone operations division to promote the sales of Intel ProShare (plus Intel RemoteExpress ISDN Lan adapters) when they were selling ISDN services.

Those agreements mean that anyone who signs up for ISDN services from either of those companies receives a substantial discount to buy Intel ProShare.

Continued on facing page



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■ Desktop video-editing - report by Tom Foremski in California

Price barriers are falling fast

New, lower-cost animation and editing systems offer good results

With a reasonably modest investment in add-on boards and software a PC or an Apple Computer Macintosh system can be turned into a sophisticated yet inexpensive version of a professional analog video-editing system costing much more.

With the addition of animation software, desktop computers become versatile video and animation authoring systems that can produce spectacular results.

Although desktop video-editing has been possible for several years, the drawback was that you needed high-end and expensive workstations. Fortunately, advances in graphics chips, faster microprocessors at lower prices, and better soft-

were now enable developers and users to edit video on reasonably inexpensive systems.

Gone are the days of 15 frames per second (fps) video editing in quarter-screen-sized windows with jerky playback that never seemed able to match the dialogue, like a badly dubbed film. These days, many video-editing packages support 30 fps which is smoother and almost matches the quality of VHS video cassette recordings. And most video playback software such as Microsoft's Video for Windows and Apple's QuickTime can play digital video at full screen and improved resolutions.

There are also low-priced add-on boards that support the MPEG

(Moving Pictures Experts Group) standard and provide improved video playback of compressed video files.

Most of the better video-editing packages use a graphical user interface and provide special effects and transition effects between scenes. Adobe System's Adobe Premiere 4.0, Ulead Systems' MediaStudio and Razor 2.0 from InSync are good examples of the kinds of sophisticated yet inexpensive video editing packages available.

PC-based video-editing systems are not yet able to match the performance of a high-end analog video editing systems designed for broadcast TV, but they can be used to assist in video-editing tasks.

There are also many tools and different types of digital video clips available. Morphing packages are popular in which the software automatically makes a transition from one image into another.

For example, the image of the face of one person, can be made to change into that of another. Software packages such as Morph from Gryphon Software offer smooth transitions between images.

There are also many CD-Rom disk based libraries of digital video clips that can be added to a video production. For example, Four Palms' Royalty Free Digital Video Libraries is a series of five CD-Rom Windows based disks with each one containing 70 video clips along the theme



Mystic demo: new special effects are available with the 3D Studio Release 4 system from Autodesk

of transportation. The collection covers air, sea and rail transportation, plus bridges and highways. Each clip ranges from four to 15 seconds long.

For high-end video-editing, costs are much higher but the flexibility offered by digital as opposed to analog video-editing systems is a valu-

able feature. Systems such as Avid Technology's Media Suite Pro and Data Translation's Media 100 2.0 have become popular alternative choices to analog video editing systems.

Video-editing software need not be complicated and there are children's software packages that teach many of the basic skills. For example, Nickelodeon Director's Lab from Viacom New Media, lets users combine video clips and add sound effects and music to create a complete video.

Animation is another task well suited to computers especially 3D animation which is used in video games to add realism. Autodesk's 3D Studio 4.0 Windows based package is one of the best 3D animation packages available. As its \$3,000 price suggests, it is aimed at professional developers.

Many multimedia authoring packages such as AimTech's IconAuthor 6.0 for Windows systems and MacroMedia's Director for Windows and

Macintosh, offer support for animation. The recently introduced mTropolis Macintosh multimedia authoring system from mFactory takes an object-oriented approach toward animation, letting developers produce animation sequences with less programming. MTropolis makes it easier for non-programmers to produce animated sequences. Again, these are expensive packages aimed at professional developers.

However, there are many low-end animation packages that are easier to use and produce good results. For example, AniCom's 3D Choreographer Windows based animation package costs just \$150 and allows users to create animated sequences.

Big Top Productions has created Cartoon Toolbox, featuring Felix the Cat, aimed at children. This Macintosh and Windows title allows users to create a Felix the Cat animated cartoon sequence with special effects, sound effects, choice of music and several different characters.

■ Images and networks - report by Philip Manchester

No simple solutions

A picture may be worth a thousand words, but moving images and documents around a network is no easy task

Images and networks are a problem. As the demand for image processing grows, current networking technology is less able to cope with the large data volumes involved. Furthermore, managing images places even greater demands on storage media and the software needed to manage it.

The amount of storage needed to store this article as a text file is about 5,000 characters. To store a full colour image of the same information at a reasonable resolution is about four million characters. While this does not mean that existing networking technology needs to be multiplied a thousandfold, it certainly needs to be improved.

"The whole issue of infrastructure is critical because image processing technologies are very data intensive and put quite an onus on the network," explains Mr Colin Weir, general manager at Bull UK with special responsibility for image products.

"So you need an infrastructure with more resources. You need greater bandwidth to cope with the data volumes. But it's not just the network. You also need skills in integration and the special storage devices."

These are pressing problems. Image processing is an important area of development for many organisations - especially when combined with document management which is the main application of image-processing technology.

Market researcher Wharton Information Systems says that installations of document management systems in the UK alone increased by 80 per cent



Colin Weir: 'Image processing technologies are very data intensive and can put big strains on a network'

in 1994 with revenues of £126m. Wharton expects the UK market to be worth £1.8bn by the end of the decade - "there are two reasons for this firstly, the growth of image-workflow technology on the desktop is increasing demand for document management server products. Secondly, image-based technology is being incorporated into existing applications across business," says Ms Andrea Wharton, director of research at Wharton.

"Image processing and document management is increasingly helping applications do their job more effectively," she continues.

The demand for image technology on the desktop is reflected in the alliances being formed between suppliers of image-processing technology and workflow software. Products such as Lotus Notes and Oracle Office are being extended to include image processing.

But Ms Wharton adds that the same trend is detectable in more established areas. She notes that Filenet, one of the leading document management software companies, has, for example, recently signed a deal to develop image technology with SAP - a supplier of traditional accounting and manufacturing software.

Mr Weir, of Bull, also sees the demand for image processing being driven by applications which build on existing systems. "Typically, it is about improving customer service and managing paper-intensive processes. Take local government, where we have a lot of experience. Revenue collection systems use large amounts of documentation - hand-written forms and so on. They need to bring all this together in an image-based document management system."

He adds that financial services organisations - such as insurance companies - have a similar need. "The more services they offer to their customers, the greater the need to offer access to information. If a customer phones in with an enquiry, staff need to be able to get at all of the relevant documents quickly," says Mr Weir.

Inevitably, this means a greater emphasis on moving images around networks - thus putting pressure on the infrastructure.

"There has to be some sort of strategic thinking by organisations to cope with this," says Mr Geoff Aldridge, workflow marketing manager at Xerox's software subsidiary, XSoft.

"In many cases you can move the references to the image across the network and only pull the actual image across when it is needed. You can also use data compression to reduce the load," he says.

Mr Aldridge also points out that developments in other areas of software are helping to resolve the problem: "The database software companies are working on distributed database techniques so that you have the information in the right place to start with."

"You also need to look for reliable network services to solve the problems of interoperability between different systems."

"This is the objective of the Document Management Alliance, to which we belong. Its objective is to provide open software across the network to support document images."

This, Mr Aldridge adds, is especially important when organisations are expanding existing applications to include image processing and document management.

"We must remember that most legacy systems were not designed with this in mind - so we need tools to help integrate the new with the old," he says.

Document images are destined to play an increasing role in IT systems and this will place a greater load both on the networking infrastructure and on software. The technology to solve these problems is moving fast, however. Communications suppliers are working on faster, higher capacity networks, hardware companies are building the input and output devices - scanners, printers and screens - and software companies are developing the management software to control it all. And for once, there is no shortage of demanding applications which will benefit from the technology. By the end of the decade, it seems likely that we will take images for granted.

Developments in videoconferencing

Continued from facing page:

Share and Remote Express. Intel's ProShare Video System 300 lets users see each other on the PC screen and work simultaneously on shared documents, 'whiteboards' and applications - while Remote Express Lan allows users to have Lan-connection performance to office LANs from wherever they have their ISDN line installed.

Intel is also not counting on telecommunications companies alone to 'carry the ball' for its videoconferencing efforts. Compaq, Dell, Digital Equipment and a range of other PC manufacturers have also committed to promoting the system. AT&T's Global Information Systems (formerly NCR) offers its own videoconferencing system - and Intel also has the commitment of companies such as Northern Telecom, Novell, PictureTel and WordPerfect to further mutual evolution of standards.

PictureTel, meanwhile, recently unveiled two new pro-

fessional group videoconferencing systems that it says are "designed to make videoconferencing as widespread a business tool as the telephone". The new high-end Concorde-4500 and mid-range Venue-2000 systems - as well as its Montage-500 series of "conferencing servers" - are supposed to replicate more closely than ever the experience of an "in-person" meeting.

"This is the biggest product roll-out in our history," said Dr Norman E. Gaut, chairman and CEO of PictureTel. "We've expanded our broad product offering with the Concorde-4500, the ultimate viewing machine against which all other dial-up group videoconferencing systems will be measured. The Venue-2000 is an important new mid-range system, designed for first-time users needing high-quality, easy-to-use videoconferencing at a popular price point. The Montage-500 delivers the industry's easiest-to-use multipoint conferencing servers, and its lowest priced four-port bridge.



The Vistum personal video system, from AT&T Global Information Systems (formerly NCR), offers co-operative working at a distance - "a way of being local, worldwide," says AT&T

Together, these products solidify PictureTel's already dominant market position."

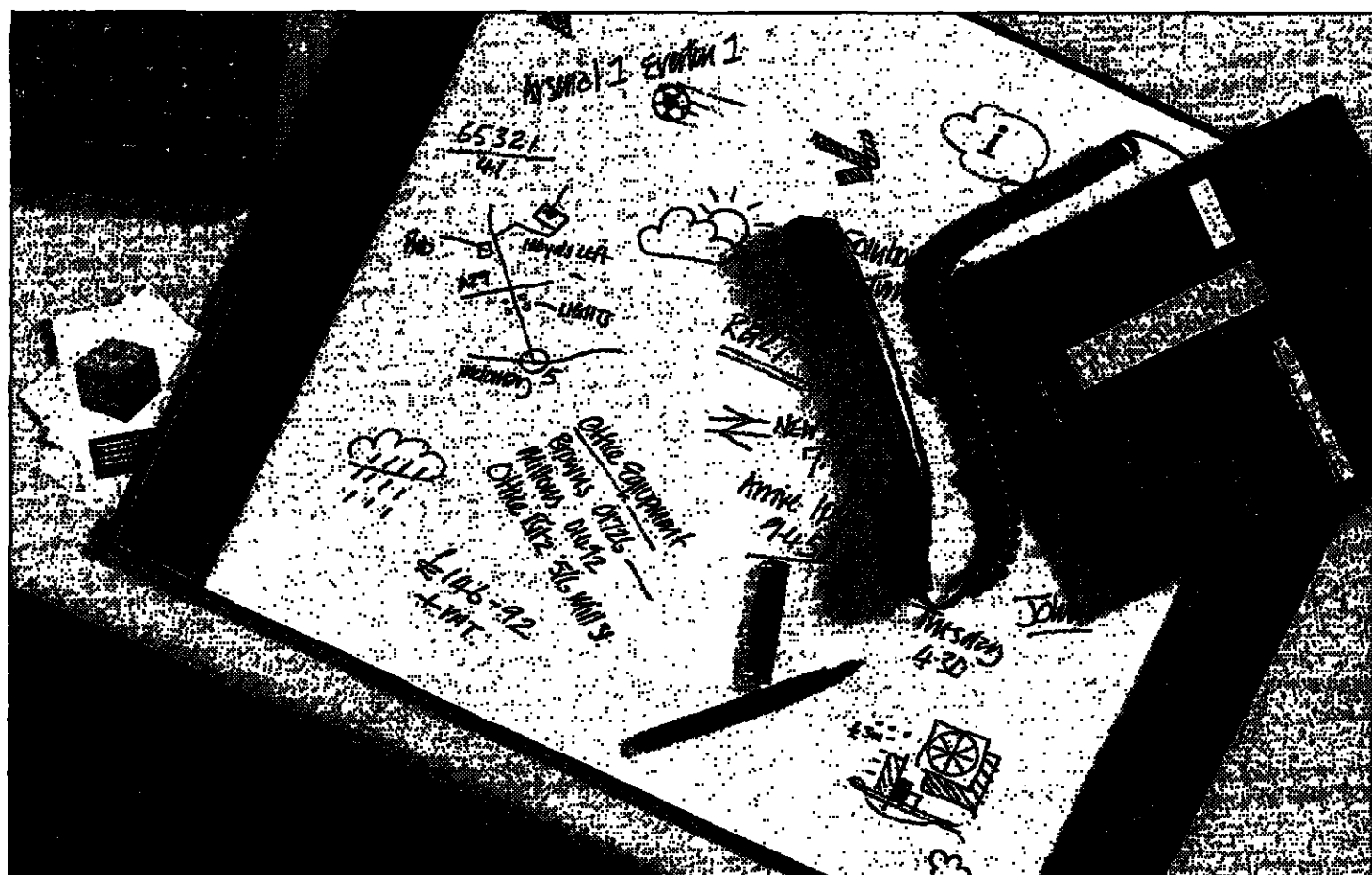
They are not, however, cheap. The Concorde-4500 has a suggested US list price of \$49,995 - while the Venue-2000 has a list price of \$21,995. The Montage-500 series of conferencing servers have US list prices beginning at \$35,000. A great many strides have

been made in PC and network-based videoconferencing over the past year, but some huge leaps may be expected in the next 12 months if even half of the planned joint arrangements between companies such as Intel, Microsoft and AT&T are achieved.

All these companies are starting to offer impressively-priced technological solutions

to videoconferencing requirements. The real question now face is: what if it is lack of demand, rather than technological or financial barriers, that has prevented growth of the videoconferencing industry in the recent past?

The answer to this query would make a great subject for debate at your next videoconference...



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18 IT directions

■ Business on the Internet - report by Louise Kehoe in California

Commerce flourishes in cyberspace

The Internet has grown far beyond its roots as a tool for US university and government researchers to become a global communications medium for individuals, governments, businesses and educational institutions

The rapid expansion of the Internet, with as many as 40m users and almost 5m host computers now linked to this global web of computer networks, has created a new form of business communication and a valuable tool for marketing and research.

Use of the Internet by businesses is growing exponentially. Last year, 46 per cent of US publicly traded companies with annual sales over \$1.5bn had a presence on the Internet.

The OpenMarket directory of commercial services on the Internet listed 1,465 companies in December 1994. Over 500,000 commercial Internet addresses were registered and new commercial sites are growing at a rate of 92 per cent a year, according to the Internet Society, an international organisation that oversees technology and applications of the Internet.

The proliferation of business users on the Internet reflects its value as a communications tool and a new marketing and sales channel. With close to 5m computer systems now linked to the Internet, so many poten-

tial customers have access to information posted on the 'Net' that businesses cannot afford to ignore it. The fastest growing portion of the Internet is the 'World Wide Web' (WWW), which provides a standard set of protocols for presenting and retrieving information. It allows users to jump automatically from one database to another by clicking on 'hyperlinks' without having to know where the information is located.

Traffic on the WWW grew by 1,181 per cent in 1994. By early this year there were over 15,000 'World Wide Web' 'home pages'. Between December 1 1993 and November 30, 1994, more than 13m megabytes of data were moved across the Internet via the WWW, according to the Internet Society.

Numerous companies have established 'electronic billboards' on the WWW to show off their wares, creating a flourishing 'commercial district' in cyberspace.

One of the appeals of the Internet is that it provides companies of all sizes with a

fast, effective and inexpensive means of data communications. Small companies gain the benefits of global networking formerly available only to large corporations with dedicated lines linking remote sites.

WWW sites range from simple lists of products to elaborate multimedia presentations incorporating three-dimensional images, sound and video created using the latest WWW software.

WebSpace, from Silicon Graphics, for example, can be used to create three-dimensional 'virtual worlds' on WWW pages. The software can be a powerful marketing tool for service industries such as tourism and restaurants enabling potential customers to view a holiday resort or pick a table for dinner by electronically 'walking' through a simulated 3D image.

The software is also expected to be used to create electronic shopping malls where customers can wander around looking at merchandise, move closer to examine products of interest and look at them from every angle. Hot Java from Sun

Microsystems is another new Web browser. Rather than simply transferring static pages of text and graphics to a user's computer, it also downloads mini-applications programs, or 'applets' created using Sun's Java programming language.

Business applications abound. Sun demonstrates a financial planning information site that features a moving share price ticker across the top of the screen.

Beyond marketing and communications, the real promise of the Internet is electronic commerce - transactions conducted via computer networks. Already there are several electronic catalogues on the WWW offering a wide range of consumer products.

Others are pursuing business to business transactions via the Internet. In Silicon Valley, for example, a consortium of high tech companies is creating CommerceNet, an Internet marketplace for electronics products. Using a secure browser program, customers can order products directly over the network.

The WWW is also a new medium for publishing groups,

with hundreds of newspapers and magazines already on the Web. HotWired, an electronic version of the trendy San Francisco high-tech magazine, is a big attraction on the WWW. The San José Mercury News, a pioneer in electronic newspapers publishing with its Mercury Center on has also taken to the Internet.

Business applications of the Internet are not, however, restricted to marketing and sales. Sun Microsystems, the leading supplier of computers linked to the Internet is also itself a heavy user of Internet applications.

The computer company is using the WWW to reduce costs of employee and customer training, printing, software distribution and customer service. Sun claims to save about \$1m each quarter by distributing software patches and pre-release versions of new programs on the WWW.

Almost any type of business can benefit from the use of the Internet's electronic mail service. Messages can now be sent

via the Internet to almost anywhere in the world where there is a computer linked to a network of telephone lines.

Over the past few years the Internet has become a conduit for millions of electronic messages. Digital Equipment, one of the heaviest users with over 40,000 computers linked to the Internet, exchanges an average of two million e-mail messages per month with people outside the company.

Unlike telephone calls, facsimiles or conventional mail, the cost of Internet electronic mail is independent of how far the message must travel, making it a big cost saver for international communications.

For all of its advantages, the Internet is far from perfect. It lacks a comprehensive directory of users and services and has suffered from troublesome security breaches.

Business users can nonetheless take advantage of the Internet today, and look forward to improved services as new software and encryption technologies continue to transform the global computer network into a robust business tool.

FT REPORTS ON THE INTERNET

The Financial Times has launched a World Wide Web site on the Internet. The service provides a week-day news summary of the main international and business news stories in the FT, plus five leading articles. Selected international indices are updated regularly while markets are open.

The service is aimed at introducing the Financial Times and FT Group services to the Internet community. Attractive graphics, short pages, as shown here, and hypertext 'navigation' facilities differentiate the site from the newspaper and from other business services already on offer.

Further developments to the site will be made in line with the response from 'Net surfers'.

The Web address is: <http://www.ft.com>

FINANCIAL TIMES REVIEW

Information Technology

FORTHCOMING ISSUES

The next issue of the IT Review will be published on Wednesday, July 5. Once again, there will be a four-section format - a main focus, a software at work theme, an update on facilities management and outsourcing, plus an IT 'directions' section. There will be no IT review on the first Wednesday of August.

The July 5 issue will include:

- Computers in Finance
- Human resources software
- Rapid applications development
- IT outsourcing report

The September 6 issue:

- Computers in manufacturing
- Enterprise intelligence
- Virtual reality
- IT outsourcing report
- IT in education and training

The October 4 issue:

- Computers in retailing
- Logistics and distribution
- Geographical information systems
- IT outsourcing report

The November 1 issue:

- Technology in the office
- Sales and marketing software
- Banking technology
- IT outsourcing report

The December 6 issue:

- Resource management
- Accounting packages
- Intelligent systems
- IT outsourcing report

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Just eight years... to build a company worth over \$1 billion Page 2	ASICs and ICs Go straight to the source Page 4	Telecoms New models... new methods Page 3	Computers Faster, better, cheaper too? Page 2	Consumer Electronics Design reuse pays big dividends Page 3
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SYNOPSYS[®] TECHNOLOGY REVIEW

Synthesis Adopted Worldwide

"Give me where to stand and I will move the Earth," Archimedes said, in praise of the multiplying effect a lever has on the strength of the human frame. For the \$100 billion a year silicon chip industry, the lever which multiplies the ingenuity of a human mind is a tool called 'logic synthesis'.

Silicon chips underpin an electronics industry expected to be worth between one trillion and two trillion dollars a year by the end of the decade. By then, electronics will be the world's biggest business, overtaking the automotive industry in the top slot. But it is a business whose growth is threatened... by ever-increasing complexity. Electronics designers have only one mantra - smaller, faster, better, cheaper. But though the inexorable miniaturisation of the chip making process is giving designers ten times more logic to work with every six years, designers are not becoming ten times more clever. The difference between the complexity offered by chip makers and designers' ability to exploit it is widening, creating a productivity gap in modern chip design. It's this gap logic synthesis helps close. So what is it?



Dr Aart de Geus, president and CEO of Synopsys.

given de Geus's program to try out - they had nothing to lose, after all - and found results were often a pleasant surprise. "The performance of the circuits was the big differentiator for our product," said de Geus, "and a key attribute for designers to use synthesis." In 1986 de Geus took the opportunity General Electric offered to commercialise his synthesis work, co-founding Synopsys (SYNthesis OPTimisation SYStems) as the vehicle. The fledgling company used the GE work to show potential customers what synthesis could do, while refining it for a commercial launch in 1988. The result, dubbed the Design Compiler, is still in Synopsys's range today, seven years later, although in a much enhanced form. But although synthesis started as the optimisation of a design at the most basic level - interconnected logic elements or 'gates' - it was only when designers started using more abstract ways of describing logic that synthesis's ability to multiply designers' productivity emerged. At the end of the 1980's a new way to describe logic using text, rather than diagrams of interconnected logic gates and wires, emerged. These 'hardware description languages' give designers the chance to hide some of the detail of a logic design by describing it at a more abstract level. As these languages emerged, Synopsys synthesis came into its own by being able to automatically translate between the levels of description, as well as optimise the detailed logic. To explain the advantage de



Make sure your chips behave perfectly right across the board - by using Synopsys' software and models from Logic Modeling. See Synopsys and IBM's first-pass silicon success story on page 2.

74% market share

When Dr Aart de Geus started working on logic synthesis, at General Electric in the mid 1980s, he used it to make a general description of a logic function fit a specific set of predefined logic elements - a form of design optimisation. Now de Geus is president and chief executive officer of Synopsys, a 250 million dollars per year electronic design automation company which has nearly three quarters of the world's logic synthesis market, according to industry analysts Dataquest. But de Geus ensured his optimisations came up with not just the simplest answers, but also those that would produce the fastest logic circuits as well. Designers who had spent weeks optimising a logic function by hand were

Geus draws a parallel with an architect describing a house to a builder. Initially the architect might define everything about how the house is built - the number of bricks in a wall, where power points and plumbing go and so on - the equivalent, in terms of its level of abstraction, of describing every logic gate and interconnection. But architects need to concentrate on where they can add most value to the process of producing houses and other more complex buildings. So they would be better served by defining how the rooms relate to each other - the garage is by the kitchen, the

Adding most value

But architects need to concentrate on where they can add most value to the process of producing houses and other more complex buildings. So they would be better served by defining how the rooms relate to each other - the garage is by the kitchen, the

kitchen opens into the lounge - trusting the builder to handle the details. In logic design terms, this would be a 'structural' description of how a function is produced. But the biggest leap of faith the architect could take would be to simply give the builder a description of what the house is expected to include - five bedrooms, three bathrooms, reception, etc. - rather than how to achieve that, and leave the rest to the builder. To make an equivalent leap of faith in logic design, engineers describe the behaviour of the logic, and leave developing the 'how' up to the synthesis tool. In electronics, the use of hardware description languages

(Verilog and VHDL) and synthesis has allowed engineers to increase their productivity tenfold or more. It has also given systems companies the chance to spend more time on exploring the key business decision they have to make - what to produce, and when, rather than how to produce it. "We see a shift in emphasis of where companies add their value, away from the actual detailed implementation to the much more detailed understanding of the application," said de Geus. "Now it's more important to have an understanding of the system - what kind of functions you want in your next portable phone, for example. So the use of synthesis has been

driven by the need to manage the increasing complexity of systems, and to free engineers from the detail of their designs. But another key driver has been the need to get products to market on time, and right first time. Take an example from the high volume, low margin multimedia industry. A high speed graphics processor for a multimedia PC may represent, on one piece of silicon, a more complex and powerful system than the 100+ chips of the original IBM PC. The chip will be built using a manufacturing process as complex as that used for the fastest PC processor, but will sell for a tenth of the price. Sales of the chip will progress from zero to maximum volume and back to zero again in nine months. The chip will have been designed in six months or less, and if the first samples don't work, then by the time the chip is revised its chance in the market will have passed. A huge investment in design and development will have been wasted.

New paradigm

Synthesis helps designers get it right first time for a number of reasons. Designers should have been able to spend more time ensuring that what they are setting out to achieve is right for its application, rather than rushing into detailed work just to get something finished in time. The use of synthesis can also help add some discipline to the overall design process. Hardware description languages and synthesis are relatively new techniques. Managers can use their introduction as an opportunity to impose some rules about design styles, design review, documentation and sign off - even design with consideration to later re-use. Synthesis can even be used to automatically include testability features in a design. Worldwide, the adoption of synthesis has created a new paradigm. The list of Synopsys' users

Coping with the fastest rate of change in human history

By the year 2000 the micro-processor at the heart of your desktop PC will use 50 to 100 million transistors to perform its role, if the predictions of the semiconductor industry's most respected figure remain correct. Twenty years ago Gordon Moore, chairman and co-founder of Intel, delivered what has become the most important statement yet made about the chip industry. In an invited paper to the 21st International Electron Devices Meeting in 1975 he said: "The complexity of integrated circuits has approximately doubled every 18 months since their introduction. Cost per function has decreased several thousandfold while system performance and reliability have been improved dramatically." The prediction that chip complexity doubles every year, now known as Moore's Law, has been borne out in the 20 years since it was made. Intel's Pentium processor uses 3.1 million transistors, its predecessor closer to one million. The P6, a follow up to the Pentium, calls on over five million transistors, while the P7, still in design, is predicted to use up to 10 million transistors. By the turn of the century, as Intel speculated in an exercise called 'Micro 2000', the processor in your desktop PC could be using 50 to 100 million transistors. No wonder then that, with such complexity to handle, designers are crying out for better tools to slash time-to-market and boost productivity - this is the challenge addressed every day by Synopsys and other leading software companies in the fast growing electronic design industry. This year's annual showcase for the business - the 32nd Design Automation Conference - takes place in San Francisco's Moscone Center from June 12 through June 15, 1995 attracting thousands of design engineers and managers from every corner of the globe.

\$40m SILICON ARCHITECTS TAKEOVER

Silicon Architects of Sunnyvale, California, has been acquired by Synopsys for almost \$40 million dollars in shares and options in a 'pooling of interests' transaction completed last month, gaining for Synopsys and their ASIC partners and customers some strategic technology for their semiconductor design. Synopsys' Cell-based Array or CBA, the methodology is used for complex ICs with multiple memories, datapaths and random logic. "Our CBA architecture is extremely efficient for deep submicron designs with strong memory and datapath content and our compilers are specifically targeted for market leading applications such as graphics, multimedia, and telecommunications," said Prakash Bhargava, who has become president of the Silicon Architects Group at Synopsys. Kurt Reutter, chief scientist at Synopsys, said, "We have been looking for a library that allows synthesis to realise its full potential for quality of results since 1987 and, in Silicon Architects' CBA library, finally, I've found it. Three new partners for Silicon Architects Group of Synopsys are Fujitsu, NEC and Toshiba, who together hold some 44 percent of the world market for ASICs, according to a recent ICE report. Hewlett-Packard, Kawasaki, and Philips are already licensees for CBA. When Synopsys customers use libraries based on CBA in their synthesis process, they achieve area reductions between 30 and 60 percent over standard gate array libraries, depending on whether the designs are logic or memory intensive. Significantly, many licensees of the Silicon Architects' technology are also semiconductor partners with Synopsys. "This strategic acquisition allows us to extend the traditional electronic design automation business model to include royalties from future sales of silicon chips," said Aart de Geus, president and CEO of Synopsys.

HOW HP AND SYNOPSYS GOT THE HP LASERJET PRINTER TO MARKET FASTER.

The HP Boise Printer Division needed to develop the key ASIC for a new HP LaserJet® Printer design-fast! So they took an Empowered Engineering approach and created a world-class design environment complete with HP 9000 workstations, Synopsys' high-level design software and Logic Modeling SmartModels® - all in an integrated environment with a common database. Synopsys' VHDL System Simulator (VSS) and SmartModels® let HP simulate the ASIC with the major components surrounding it - pins-out, verification-to verify its performance for production. Plus, Synopsys' synthesis and VHDL code reuse capabilities will save HP redesign time in the future. HP's designers can choose from 250 target silicon libraries and port code for the same chip to more than one vendor. This demanding process was expedited thanks to the great performance of HP's powerful 9000 workstations. Propel your products to market - use Synopsys' proven software and Logic Modeling models.

For further details, call your nearest Synopsys office: UK: +44 1734 313822 France: +33 1 45 12 0608 Germany: +49 89 99 39 120 Japan: +81 3 4341 5300 Singapore: +65 296 7433 US: +1 900-346 6335

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HEWLETT PACKARD

2 TECHNOLOGY REVIEW

Building a company worth over one billion dollars in just 8 years

Frustrated with the flow of red ink in its semiconductor operations, General Electric decided in 1986 to cut its losses and sold the business to RCA. But a brilliant computer engineer, Aart de Geus, who had pioneered semiconductor design technology in GE's North Carolina facility, wouldn't let his dream of revolutionising silicon chip design slip through his fingers and today the company he helped to create has a market value of over one billion dollars.

He asked GE to let him take the new design technology and spin it off into a new company. GE thought so highly of de Geus that it not only gave him approval to start up the company, but it also invested one million dollars in seed money in the new venture.

For the next two years, de Geus and a handful of colleagues perfected their new design tool, and in 1988 they showed their product for the first time to venture capitalists in California.

Venture capital

Impressed with de Geus' concepts and conviction, the venture capitalists underwrote the young company, but with two conditions: the company had to move to Silicon Valley in California and a chief executive had to be hired to run the company. De Geus quickly agreed and since the day when he and Harvey Jones, who became CEO but is now chairman of the board, joined forces, the two men have not looked back.

Today Synopsys, Inc. (NASDAQ:SNPS) is a leader in developing, marketing, and supporting high-level design models and software for designers of integrated circuits (ICs) and electronic systems. The company pioneered the commercial development of synthesis technology, which is the foundation of the company's high-level design methodology. Synopsys offers a comprehensive set of synthesis, simulation, test, and design reuse solutions, which support both Verilog HDL and

VHDL. It has a payroll of over 1,200 employees, worldwide sales expected to top a quarter of a billion dollars in 1995, annual growth of 30%, and a stock value of \$1.1 billion.

Revenues triple

In April 1995, the company reported second quarter revenues of \$62,500,000, against second quarter 1994 revenues of \$47,200,000. For the first six months of fiscal 1995, Synopsys reported revenues of \$120,500,000, up \$29.1 million from the first six months of 1994, and net income of \$16,140,000 (84 cents per share) against net income of \$5,403,000 (29 cents per share) for the same period.

This upward trend is reflected in its year-end figures: it closed the 1994 fiscal year with revenues of \$196 million, a 37% increase over the previous year's \$142.7 million.

This tripling of revenues over the past three and a half years is a direct result of the productivity value the company has brought to its customers, according to Brooke Seawell, senior vice president and chief financial officer. "It is achieved through continuous enhancements of our core synthesis products, new innovative design tools, extensive modelling solutions, and superior consulting and support services," he said.

Emerging markets

"Electronic engineers used to design electronic chips by drawing on paper how the various components of the chip such as the gates and the transistors would be interconnected," said Jim Tully, an analyst with leading market research firm Dataquest.

"The problem was that the way you interconnected the components defined the functionality of the circuit. If you interconnected

them one way, your chip would be an electronic counter. If you interconnected them another way, the chip is one you might use in a telephone. Also it was very time-consuming."

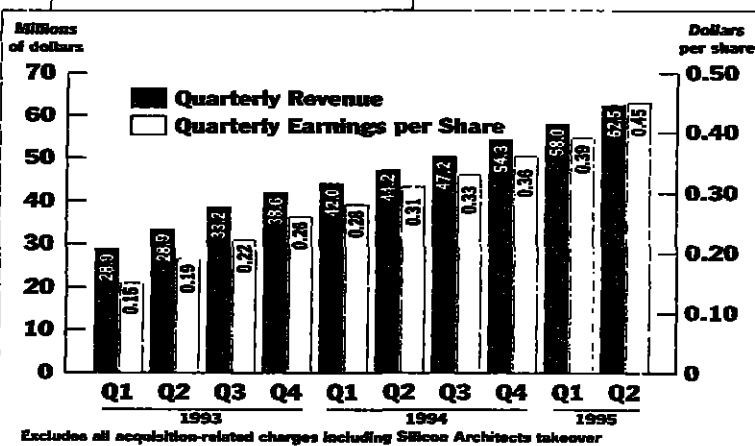
De Geus' invention of logic syn-

Millions of dollars in Time-To-Market savings

Imagine you are faced with producing a new computer or workstation design with an 18-month product life and potential sales of at least ten million dollars.

For every month longer the design takes to complete than planned by the design team, the lost revenues total 1.6 million dollars.

Reducing the design time by use of High-Level Design techniques and synthesis improves the quality of results and achieves the goal of required performance faster, making money instead of losing it.



thesis revolutionised how chips and application-specific ICs were made. It provided a new methodology that was faster, cheaper and more reliable.

Instead of drawing how each chip would be made, the specification was written out as a mathematical description, similar to a computer code or algorithm, enabling logic synthesis to translate it directly into the circuit.

For 1995, Synopsys is projecting that 50-55% of its sales will be in North America, 20-25% in Japan, 20-25% throughout Europe and the remaining 5-10% in emerging Asian markets such as Taiwan, the Chinese People's Republic, Singapore and South Korea.

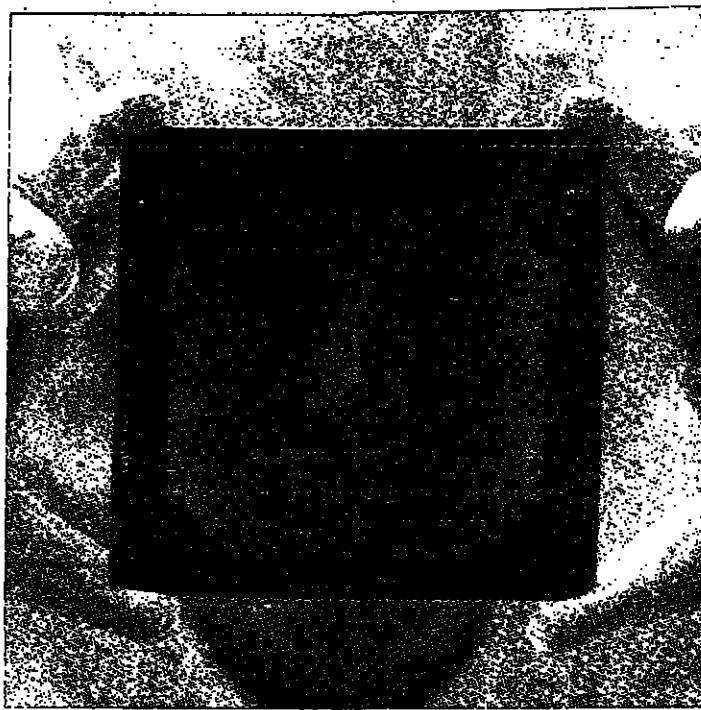
Sales projections

While Synopsys' revenues account for some 15% of the \$1.6 billion electronic design automation business, when it comes to logic synthesis — the cornerstone of the company's business — in some segments it has 74% market penetration worldwide. Today, the company has licensed over

7500 copies of its basic design software to some 600 customers.

Best run EDA company

The company has a strong following in the US financial community where it is considered to offer the key for the next genera-



First pass silicon successes with Synopsys tools and IBM

Designers using Synopsys Test Compiler and Design Compiler with IBM Microelectronics high-performance ASIC technologies have achieved first-pass silicon success on more than 45 ASIC designs ranging in size from 150K-gates to almost one million gates. Successful customers include companies such as Cray Research, Unisys, 3DLabs and 3DO.

The Synopsys design-for-test (DFT) solution is available for all IBM process technologies, including the recently announced 0.36-micron L-effective CMOS 5S process.

tion of electronics design automation, as every 18 months complexity doubles.

Peter Schleider, managing director for Wessels, Arnold, & Henderson of Minneapolis, who helped the company when it made a public offering in 1992 at 18 dollars a share, thinks it is the best-run EDA company in the industry. "They know who their customers are, where they are, but on top of that they support, train, and consult with their customers very well," he says.

Synopsys' renewable income is often cited by analysts. For the second quarter of fiscal 1995, the company's renewable income-including training, consulting and maintenance - was 40% of its total revenue of \$62.5 million.

"They run their business so you don't have to worry as an investor that they're going to make their next quarter. Also, they're not holding back the technology their

Synopsys forms core DSP team

Last month, Synopsys announced the formation of their core team of Digital Signal Processing (DSP) experts to focus on research and development, marketing, sales and training for the company's DSP design software products. Their goal is to provide Synopsys customers with a fast path from concept to implementation for DSP-based systems.

The company plans to build its leadership in DSP design with innovative system modelling, hardware/software co-design, and co-simulation technology.

"This high-calibre team of DSP experts is essential to broaden Synopsys' reach into the systems market and to achieve our objective of making system designers more productive," said Penny Hersch, vice president and general manager of Synopsys' Design Environment Business Unit.

"To ensure customer success, we've created a team that can lend

the appropriate level of support at every stage of the relationship, from pre-sales evaluation all the way through to successful completion of a DSP-based system design. Most importantly, our marketing, sales, consulting and training personnel are backed up by a phenomenal R&D team focused on delivering innovative DSP design technology."

Director of DSP Tools Joachim Kunkel heads up the DSP Tools group responsible for DSP product development at Synopsys. The group is largely made up of the former R&D team of CADIS GmbH (Aachen, Germany), acquired by Synopsys in May 1994.

"In the past year, the Synopsys DSP R&D team has made excellent progress in DSP design software product development," said Mr. Kunkel. "Just six months after the acquisition, Synopsys announced Version 6.7, which included direct links to the company's Behavioral Compiler."

continued on page 4

DAC'95 June 12 to June 15

Proven Path to Best Silicon

Visit DAC '95 between June 12 to June 15 at the Moscone Center in San Francisco to see Synopsys' showcase of software tools, models, and methodology ready to take you on the proven path to best silicon.

This includes the first public demonstrations of Version 3.3 of Synopsys tools, which started shipping to customers last month. Demonstrations will also show what Synopsys' customers have achieved, in record time, using high-level design techniques centred around Synopsys synthesis.

Visitors will also discover how customers are using other Synopsys tools, such as the new Source-Level Design tools, to achieve dramatic increases in productivity and find how modelling enables designers to verify their ASIC designs in the actual context of their system, to help ensure first-time silicon success.

So what's on this proven path?

Digital Signal Processing

This design process starts at the highest level for customers interested in digital signal processing design. The latest COSSAP tools let you describe your entire DSP application, then implement it in either software, for industry standard DSPs, or hardware, in custom integrated circuits. COSSAP uses Synopsys' proven path to successful silicon, from behavioural description all the way down through synthesis.

Behavioral Compiler

Behavioral Compiler is Synopsys' behavioural synthesis tool to make design trade-offs early in the design cycle. Behavioral Compiler synthesises and optimises algorithmic-based designs, allowing designers to specify the functional behaviour of a circuit without detailing the exact architecture. Then you can make easy decisions about trade-offs between various architectural implementations. Synopsys has taken an innovative approach to behavioural synthesis that makes

the tool valuable for virtually all designs that are best described by an algorithm. These applications are typically found in telecommunications, high-end graphics, multimedia, data encryption, and servo control.

Design Verification

You'll find a comprehensive demonstration of our VHDL System Simulator (VSS), complete with software and hardware model verification. This three-engine simulator provides verification at the behavioural, RTL, and gate levels.

Source-Level Design

You can design quality in up-front, faster and easier, with Synopsys' new Source-Level Design tools. The first two Source-Level Design tools will be on display: DesignSource, which lets you streamline your design process, and HDL Advisor, which gives you complete source analysis.

Using these tools, you can perform fewer design iterations faster, quickly track problems to their source, and easily share and reuse designs. We'll show you how effective

they can be used to implement an FPGA design faster.

Power Analysis

Synthesis optimises for area and performance. But what about power? Power is becoming more and more of an issue for designers of compact and especially portable systems. You can't wait until your design is finished to find out if you're over the limit. Using DesignPower, you can analyse the power requirements of your design right at the start, where it will make the most impact.

Advanced Synthesis for Deep Submicron Design

As silicon breaks through the half-micron barrier, you need to be ready with advanced tools to meet the submicron design challenge. We'll show you how to use advanced capabilities to link your design effectively to layout and manage designs with huge gate-counts better and more efficiently.

Leading the Intellectual Property Revolution

Landmark deal with Intel

In what many industry observers believe will prove to be the biggest change in conventional design techniques, chip designers are moving to more reuse of existing 'building blocks' in parts of complex chip layouts to save re-inventing previously successful, proven designs.

Significantly, the first announcement of DesignWare - an innovative way to speed design reuse and protect valuable intellectual property rights - was made by Synopsys in 1992.

According to Daratech, an independent research firm focussed on the booming computer software industry, Synopsys was one of the fastest growing companies in the CAE sector last year and, they forecast that Synopsys will grow its revenues very rapidly through the widespread adoption of DesignWare and increasing design reuse.

The reasons, given the doubling of complexity in chip design every 18 months and time to market pressures, are obvious to managers.

Despite the ability of synthesis to multiply the productivity of designers, the gap between what it is possible to build on a chip and what it is possible to design in a reasonable time is still growing. The way to tackle this problem is to reuse parts of a design that have been done before - a technique that is eased by the use of synthesis.

Take the example of a GSM cellphone. This year the logic that converts the binary digits of a GSM phonecall in to speech may form the heart of the world's smallest, lightest handset. Next year the market will have moved on and the logic design will have to evolve. The effort that went into it will have to be paid for entirely by the sales of that one handset design - unless, of course, the design can be reused.

Perhaps it can be used in a wireless modem for a PC, or a low cost cellphone to go in a truck? Perhaps the intellectual

property of the design, expressed as a hardware description of synthesizable logic, could be sold to a third party. Or perhaps it could be marketed as if it were a music CD, in a shop, through a catalogue or via the Internet.

Reusable designs

"We're seeing a move into the domain of reuse of pieces of intellectual property," said Aart de Geus, the president and CEO of Synopsys. "The fact that these building blocks of design carry value in their own right is

a new dimension to the electronics business. It's not just a technical challenge, but a business and legal challenge to create the environment where they can be exchanged.

At Synopsys, the basis of this effort is manifold - a program called DesignWare, the recent merger with Logic Modeling, and the acquisition of the Arcad modelling and consultancy service in France.

DesignWare is a library of 'canned' synthesizable logic descriptions ready for use. Synopsys is expanding the DesignWare library, and encouraging third parties to add designs to it as well.

Last year, in a landmark agreement with Intel, Synopsys announced it is using the DesignWare approach to accelerate the uptake of the emerging PCI bus add-in card standard by putting the logic that surrounds it into the DesignWare library.

Enabling technology

The merger with Logic Modeling has strengthened Synopsys' position as the industry's prime source for intellectual property in electronics, since Logic Modeling has for years worked with chip vendors to create over 12,000 software and hardware models of their latest chips for use in boards and system designs. The acquisition of Arcad S.A. in Montpellier, France, adds a bespoke modelling and consultancy arm to Synopsys's offering.

The message from Synopsys is clear. Complex electronics design cannot be done in a timely fashion without the use of synthesis. Design reuse can further speed up the development of large scale 'systems on a chip', and also offers the promise of a revenue stream beyond the life of the original product.

"We're betting the company on achieving a tenfold increase in electronics designers' productivity every six years, because if we don't we won't succeed," says

de Geus. "Historically, companies in this business that give up on keeping in step with the rate of development of silicon just don't make it."

Clearly, with a team already totalling more than a thousand people around the world, de Geus intends that Synopsys will go on and on succeeding and innovating at the leading edge. For the foreseeable future, logic synthesis is the enabling technology providing the critical lever to ensure it does.

First Telecom Models from Europe

At DAC, in San Francisco, the Logic Modeling Group of Synopsys, based in Portland, Oregon, are announcing their Telecommunications Workbench - a suite of three tools designed to simplify and speed the work of design engineers in creating robust simulation testbenches for SDH, SONET, and ATM standards.

Originally developed by the Arcad Group in Montpellier, France - another company acquired by Synopsys late last year - these are the first commercial products to streamline verification and validation of telecommunications designs which meet international transmission and switching standards.

Each Workbench offers designers higher compliance with their chosen standard, smoother interoperability with other systems components, and faster time to market. For engineers working with enormously complex telecommunications standards, such benefits can mean all the difference between success and failure.

Logic Modeling is the leading supplier of simulation models for the electronic design automation industry and it maintains on-going product development relationships with leading companies in the EDA and semiconductor industries. For more information, call (503) 690 6900, or email modelinfo@synopsys.com.

Europe: Centre of Design Excellence and Support

"The view from Europe is quite different," says Rolf Åberg, vice president in charge of all European operations for Synopsys. Ever since the company made its first sales to Siemens, Ericsson, Alcatel and other leading companies headquartered in Europe, Synopsys has been growing its indigenous activities in Germany, France, the UK and other parts of the European Union.

Driving most of the business are users who are at the leading edge of technology in telecommunications, serving worldwide markets and designing highly innovative products and systems such as cellular handsets, base stations and other complex gear in fast moving, competitive technology sectors.

Several key companies with unique technology have been acquired in Europe over the past three years, starting with Munich-based Compiled Designs. Last year, Synopsys also acquired CADIS GmbH and a French company, Arcad S.A. to create extra capabilities in DSP hardware/software co-design and telecom applications.

"Now we have created the critical mass, we can build on these centres of excellence in Aachen and Montpellier. Our aim is to develop not only more innovative

technology for telecoms applications but importantly, expand our range of consulting and support services," says Rolf Åberg.

In a separate initiative, under the EUROCHIP programme, Synopsys' tools have been placed in more universities throughout Europe than any others, including many former East European centres of higher education. As a result, over the next few years, large numbers of graduates will enter the design market already familiar with high-level design languages and synthesis, together with simulation, design-for-test, and other key chip design methodology.

Faster, better, more reliably and right-first-time... with Synopsys.

More than 75 per cent of world-leading computer, communications, and consumer electronics companies already use high level design automation tools and software from Synopsys, the pioneers of commercial logic synthesis.

Try out new ideas. Choose the best approach, from initial concept right through to deep sub-micron layout. Discover how Synopsys enables you to repack your designs and reuse or resell them, whilst protecting your intellectual property rights worldwide.

Working at higher and higher levels of abstraction, design teams can specify the exact functions and behaviour they want from new systems. Synopsys enables engineers to design and test not only advanced chips but also complete electronic systems, dramatically increasing productivity and accelerating time-to-market... globally.

SYNOPSYS

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New DSP development kit

Using the latest COSSAP development kit from Synopsys, designers can easily incorporate Texas Instruments' new TMS320C541 and TMS320C542 DSPs and cores into electronic systems and ASICs for wireless communications. The kit improves designer productivity and time-to-market by using a stream-driven simulation approach that accelerates system-level design, providing a single environment for hardware-software co-design, co-simulation and system-level verifications.

"TI's powerful DSPs and DSP cores are driving signal processing into mainstream applications," said John Cooper, DSP marketing director at Synopsys. "In wireless communications, for instance, leading cellular and PCS manufacturers are using advanced DSP techniques to meet stringent performance, cost, and power consumption targets."

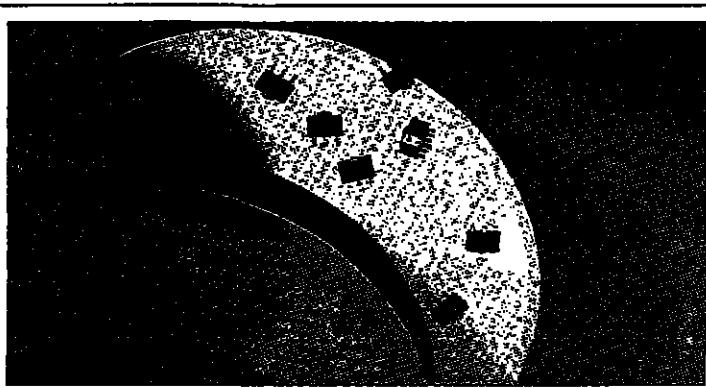
"To get these systems to market quickly, designers must have a comprehensive development environment for algorithm design, architectural exploration, hardware and software

implementation, co-simulation, and co-verification."

Synopsys' COSSAP DSP development environment offers designers a fast implementation path for turning their DSP concepts into systems. The Synopsys modelling environment takes full advantage of the data flow nature of signal processing systems to provide easy algorithm specification, fast simulation, tight links to Synopsys' industry-proven logic and behavioural synthesis tools, and co-simulation for verification.

COSSAP also provides optimal hardware and software DSP and HDL code generation through integration with Synopsys' leading synthesis technology. In addition to the simulator and development kit for TI's C54xDSPs, the Synopsys DSP solution features: a block editor with extensive signal processing libraries, including full standard-compliant GSM models for algorithm and architecture development; an HDL code generator for behavioural and RTL design; a powerful DSP code generator for optimal C generation and an interface to Synopsys' VSS VHDL simulator for co-simulation.

LINKS TO LAYOUT



Deeply in-SYNC for Submicron Design

In-SYNC is a new customer-driven programme with 17 charter members - all EDA vendors - just launched by Synopsys providing joint design-solutions based on Synopsys' and in-Sync partner design tools with particular focus on links-to-layout and deep submicron designs.

The two primary goals are: to meet mutual customer requirements for joint solutions; and to drive quickly new technology

to market, leveraging advanced technology from Synopsys and in-Sync partners.

"Through in-Sync, we're putting a solid structure in place for working with other EDA companies to provide mutual customers with a set of tools that work well together," said a spokesman. "The really exciting opportunity here is to work at a deeper level with partners to bring new technology to market faster."

4 TECHNOLOGY REVIEW

Moving to higher levels of abstraction

Behavioural synthesis cuts specification time by up to ten times

Introduced last year, many users are already finding significant benefits including performance gains up to 20 percent from the first commercial Behavioral Compiler from Synopsys, the most important new development since Design Compiler was launched to provide logic synthesis in 1988.

Behavioral Compiler, a behavioural synthesis tool for integrated circuit (IC) design, cuts specification time 5-10x, slashes simulation run time, and enables design exploration and reuse, providing high quality results. Synopsys has taken a different approach to behavioural synthesis that makes the tool valuable for virtually any algorithmic-based designs, applications typically found in telecommunications, graphics, multimedia, data encryption, and servo controls.

"As the leader in logic synthesis, our customers have been asking us for behavioural synthesis for years," said Aart de Geus, president and CEO at Synopsys. "We told them we would only introduce a behavioural product when it adds significant value for a wide range

of applications," he said at the launch. Behavioural synthesis raises the level of design abstraction once again this time from the RTL (register transfer level) to the behavioural level.

The functional specification of a design is captured in Verilog or VHDL without detailing the exact architecture. The Behavioral Compiler then optimises the design to meet performance goals while minimising chip area.

"We estimate that more than half of the VHDL code for our typical design can now be written at a higher level of abstraction," said Geert Van Wauwe, responsible for advanced CAD in Alcatel Bell's Microelectronics Design Centre. "The code written for Behavioral Compiler will be at a level above actual implementation and will be more natural, understandable, and most importantly, easier to modify and reuse. In addition, all of our VLSI designs contain modules where scheduling a scarce resource consumes a vast amount of design time. By working at a higher level of abstraction, this problem is eliminated."

Many ASIC design teams start with an algorithmic specification in C or C++ and target performance goals. From there, the designers manually schedule the design and hardcode a lengthy RTL (register transfer level) specification. With Behavioral Compiler, designers can write a behavioural specification that is very similar to the original algorithm. The behavioural specification can be up to 10 times shorter than an RTL specification for the same applications.

Cuts Specification Time

Behavioral Compiler automatically infers the design's controller from the behavioural specification. This means that the designer doesn't have to specify the controller and doesn't have to hand integrate the controller with the datapath. The result is much shorter specification time.

Behavioral Compiler also automatically infers memory reads and writes from HDL array accesses, which means that it can automatically schedule memory access. So the designer no longer has to spend a lot of time work-

ing on tedious memory timing and scheduling issues. This makes the tool extremely useful for memory-intensive applications, such as those found in high-bandwidth communications, including ATM designs.

The Behavioral Compiler includes three powerful scheduling modes, allowing designers as much or as little control over the design timing as they would like. By using actual technology-specific timing and area costs from Synopsys' architectural and logic synthesis, Behavioral Compiler delivers very high quality results.

"By including controller and memory inferencing, we are making the Behavioral Compiler a great productivity tool for many more applications, beyond just datapath scheduling," stated Emil Girzyk, a Synopsys R&D director who has done extensive academic and commercial research in behavioural synthesis.

One of the reasons that Behavioral Compiler is successful where other behavioural synthesis tools have failed is the tight integration with Synopsys' architectural and logic synthesis tools. This assures a high quality of results for a specific target

technology. Behavioral Compiler accepts both Verilog and VHDL descriptions.

The new tool makes use of Synopsys' architectural synthesis tools, the HDL Compiler family, and its logic synthesis tools, the Design Compiler family. It also takes advantage of DesignWare libraries of synthesizable pre-defined functions, including technology-specific DesignWare offered by semiconductor vendors.

Record Results

Synopsys reported revenue of \$62,500,000 and net income of \$8,676,000 (45 cents per share) in its second fiscal quarter ended March 31, 1995.

New Asia/Pacific Office

Synopsys has opened new offices for their Asia Pacific headquarters in Singapore. Over the past two years, Synopsys has achieved significant success in establishing important business relationships in Korea and Taiwan. The new Singapore location will provide many new advantages as Synopsys continues to expand emerging markets in China, Singapore, Malaysia, and India.

Asia Pacific regional manager Kah Yee Eg hosted a gala party at Singapore's Shangri-La Hotel to celebrate the opening of the new offices.

Smoothing the Ride on the PC Card bus

Following the landmark deal with Intel last year, Synopsys is shipping a new design kit for PC-Card Bus designs with a new, customisable PCI macroset, as well as a PCI test suite and bus model. The MacroSet, from the Synopsys' DesignWare product line, features seven flexible, synthesizable, high-level design blocks that drastically reduce design time. The set allows optimisation between die size and functionality and is compliant with PCI special interest group (PCISIG) 2.0 specification.

"The PCI local bus is a fundamental building block of today's computing systems," said a spokesman. "Without our PCI design kit, ASIC designers must develop their own PCI interface logic from scratch or use inflexible, technology-dependent cores from ASIC vendors. To verify compliance to the PCI standard, those designers will also be reading through pages of specifications and constructing test cases for each condition and mode of operation. The Synopsys PCI kit eliminates those roadblocks with a total design solution enabling the rapid development of ASICs with PCI interfaces."

The necessary work can be done in a matter of weeks, instead of months.

continued from page 2

Building a company worth over \$1bn

because they're investing in the newer generation of tools to offer their customers," Schleider said. For the second quarter of fiscal 1995 year, the company, whose gross margin is 88%, spent over 12 million dollars on research and development, equivalent to some 20 percent of income.

Growing 30% p.a.

Recently Synopsys, which is traded on NASDAQ, was selling briskly at \$58 per share with 80% of its stock held by institutional investors such as T. Rowe Price, Fidelity, and Amerindo. Last year, having merged its operations with Logic Modeling of Portland, Oregon, Synopsys

Synopsys pioneers source level design for hardware designers

Earlier this year, Synopsys announced a new family of source-level tools for Verilog and VHDL design. At the source level, hardware designers can have the greatest impact on improving design quality and accelerating the overall design cycle.

These tools enable a major shift in hardware design that parallels the shift in the software industry in the 1980s when source-level software development tools eliminated the need to work at the assembly code level.

Two products form the foundation of the new Source-Level Design tool family: DesignSource for full source capture and HDL Advisor for direct source analysis. By using these products, designers can quickly specify their complete design, then in minutes check its performance, and track down any problems; all at the source level. Today designers often find problems only after taking hours or days to generate a gate-level design. For the first time, designers will be able to iterate directly on their source, before simulation and synthesis, reducing the need for more expensive iterations later in the process.

"This is an inevitable and positive shift for hardware designers," states Aart de Geus, president and CEO of Synopsys, Inc. "We envision a day when hardware designers who work with gate-level constructs are as rare as software engineers who work with assembly code. We have a long way to go but these innovative tools are a major step forward."

"The concept of source level tools makes a lot of sense," stated Steve Edlefsen, Member Technical Staff (MTS) at TRW (El Segundo, CA), an alpha customer for Synopsys' new Source-Level Design tool family. "If I could do design iterations before simulation and synthesis, I would definitely design faster and get better results. Based on what I've seen so far, I'm excited about the potential of this new technology."

Fundamental shift

This announcement portends a fundamental shift in hardware design that's analogous to the shift that occurred in software design with the advent of source-level analysis and debugging tools now on the market from Microsoft, Borland and other major software development tool vendors. The software world rapidly adopted source-level tools because designers realised immediate productivity gains. Today, virtually all software development is performed at the source-code level. Now, Synopsys is addressing this need in hardware design.

"The move to source-level design will have as significant an impact in the hardware world as it had in software," stated Gary Smith, Senior Analyst at Dataquest. "Designers basically want to see as much information as possible, as early as possible. Since the source is

what they created and understand most intuitively, designing at the source will deliver immediate productivity gains.

Higher Quality Designs, Faster

Source-level design allows designers to iterate directly on their source prior to simulation and synthesis. These iterations take minutes and ensure that the designer takes the best source possible through simulation and synthesis - resulting in a smoother, more predictable design cycle, with far fewer back-end iterations. Designers can capture all inputs in a complete source specification and efficiently drive designs through verification and implementation.

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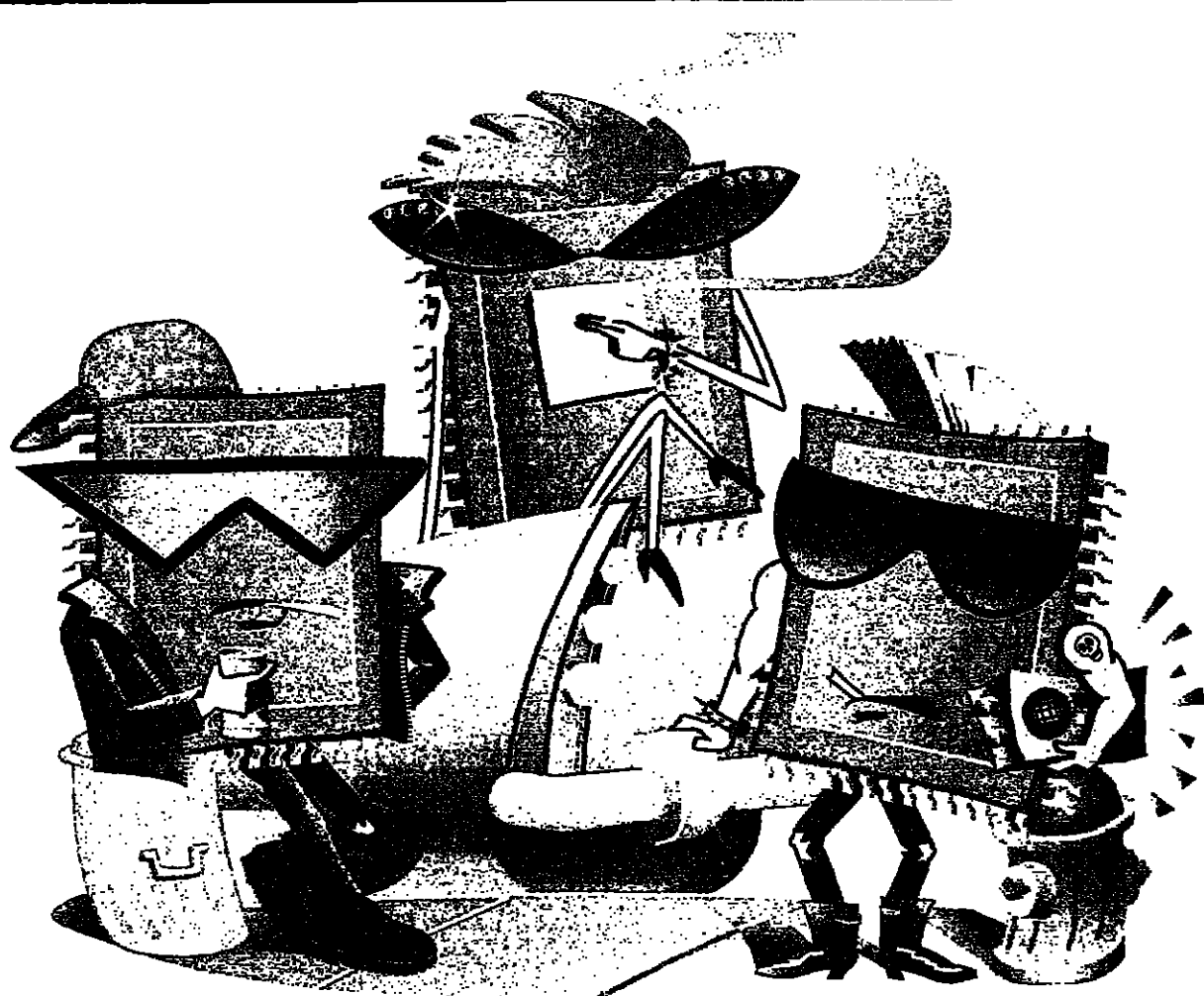
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